VOL. XXXI. — No. 12. DECEMBER 1954

# Monthly Bulletin of the International Railway Congress Association

(English Edition)

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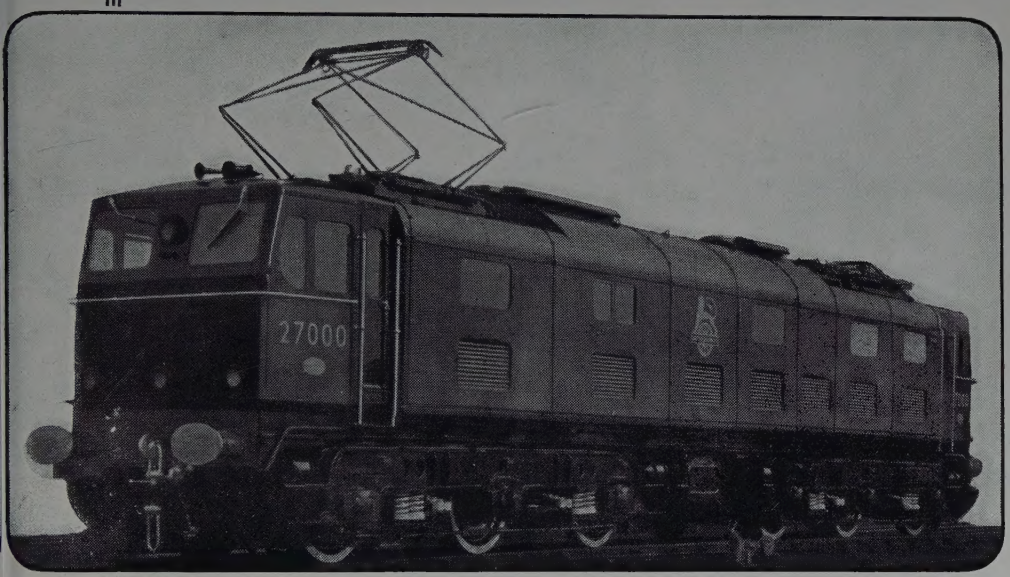


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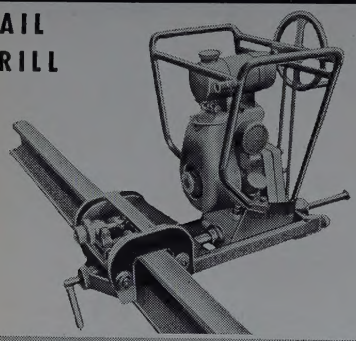

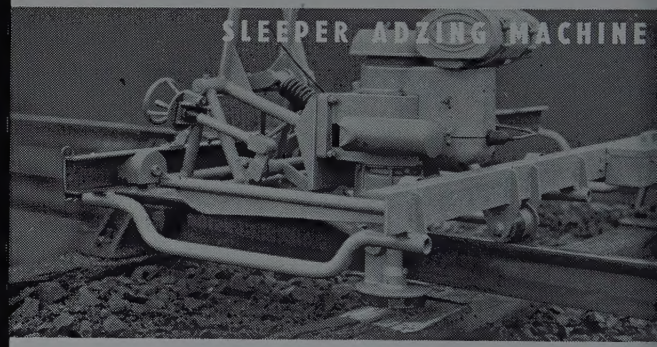


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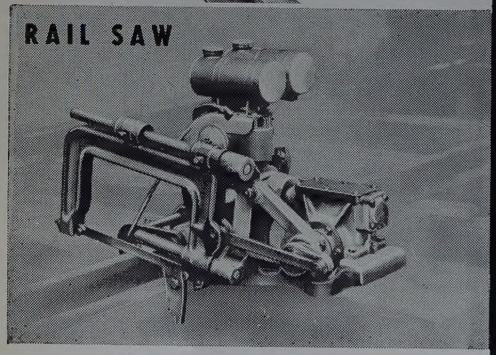

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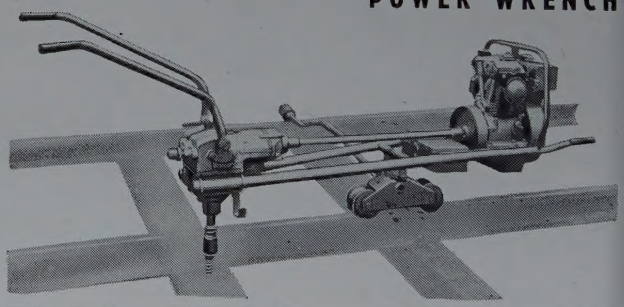

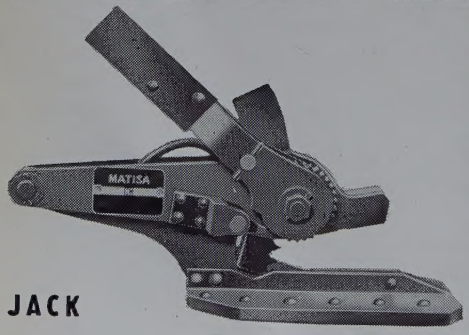


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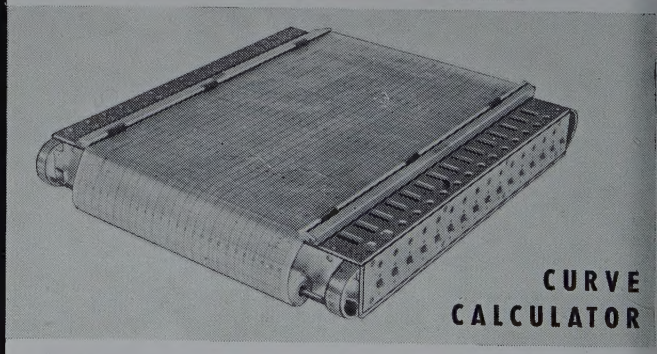

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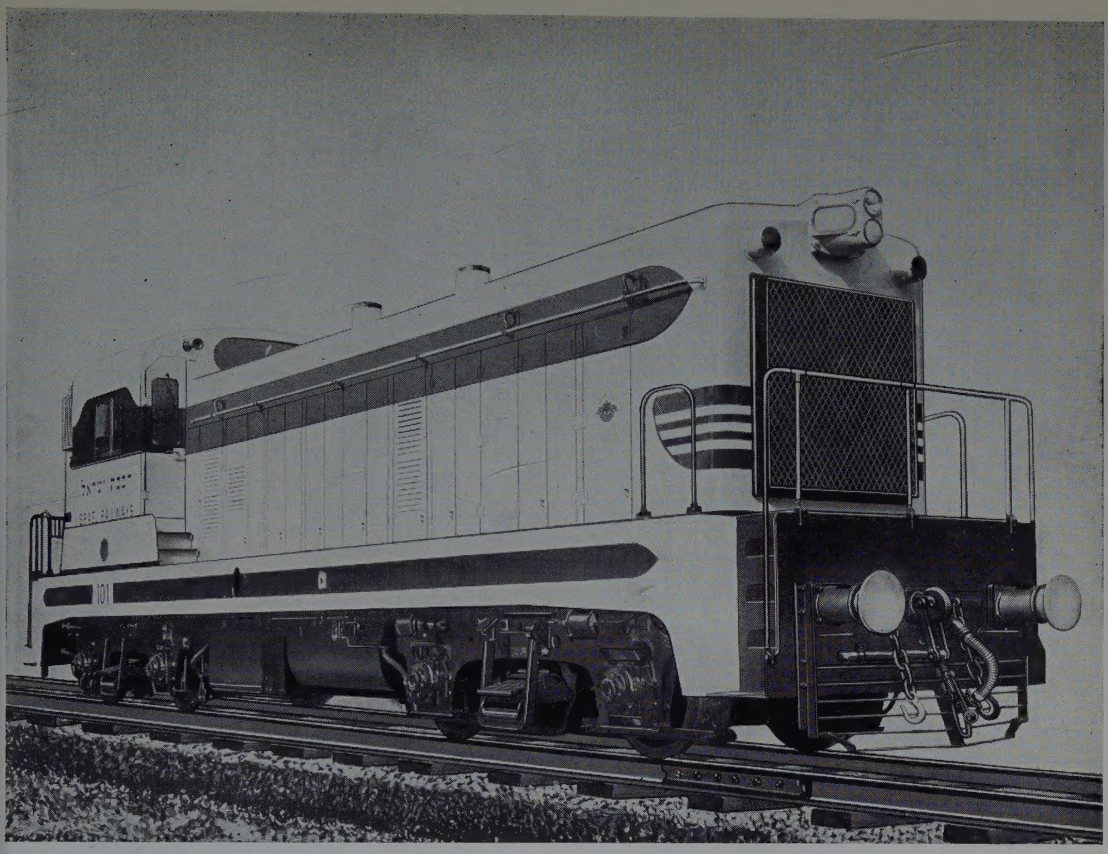

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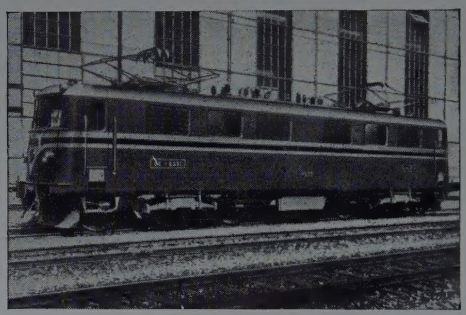

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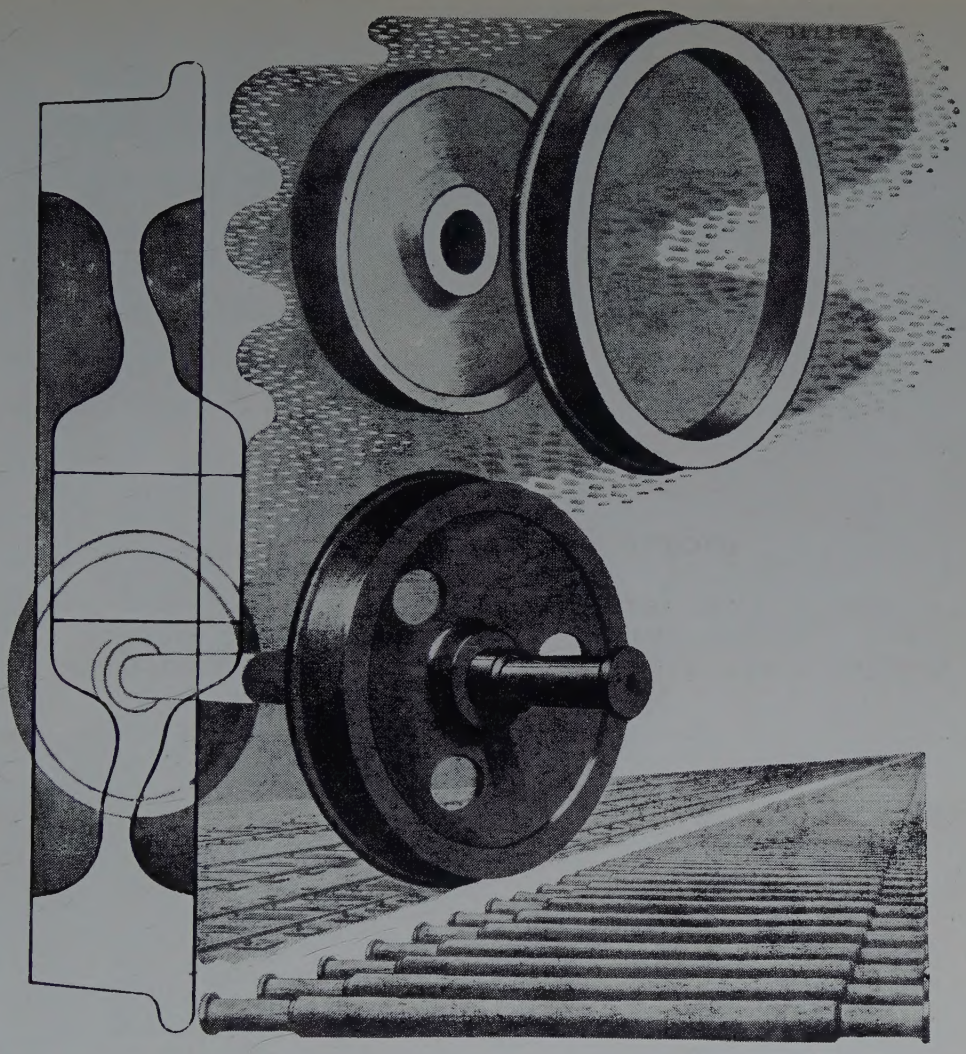

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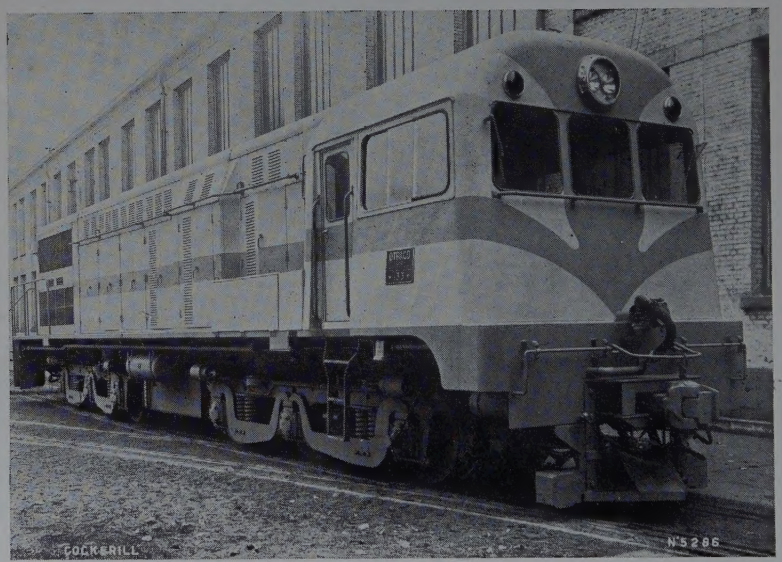


*One of the Diesel-electric locomotives, Cockerill-Baldwin, 1 600 HP, for the line Matadi-Leopoldville (Belgian Congo).*

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**Sixteenth Session, London :** 19 th. to 26 th. May 1954.— General proceedings in sections and in plenary meetings (1st. Section : *Way and Works)*. (25 000 words.)

**1954** **625** .17
Bull. of the Int. Ry. Congr. Ass., No. 12, December, p. 1129.
**What are the present tendencies relating to the organisation of the permanent way : methods of determination of the works to be done and in particular, possibilities of the use of detecting-recording coaches; planning of the works, effects of mechanisation; importance of the sidetracks for the movement of the gangs and the mechanical devices. Economic and financial aspect.** (Question I, 16 th. Congress.) Discussion. (15 000 words.)

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a) **Modernisation of station buildings and methods employed in financing modernisation projects.** b) **Standardisation of units construction applied to railway buildings.** (Question 2, 16th Congress.) Discussion. (10 000 words.)

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# MONTHLY BULLETIN

OF THE

# INTERNATIONAL RAILWAY CONGRESS ASSOCIATION

(ENGLISH EDITION)

PUBLISHING and EDITORIAL OFFICES : 19, RUE DU BEAU-SITE, BRUSSELS

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**Advertisements** : All communications should be addressed to the Association, **19, rue du Beau-Site, Brussels.**


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**An edition in French is also published.**

Vol. XXXI. — No. 12. December 1954.

# BULLETIN
OF THE
# INTERNATIONAL RAILWAY CONGRESS
ASSOCIATION
(ENGLISH EDITION)

[ 385 (06 .112 ]

SIXTEENTH SESSION

**London : 19th-26th May 1954.**

# GENERAL PROCEEDINGS

## 1st Section : WAY AND WORKS

## INAUGURAL MEETING
**May 20th, 1954, at 9 a. m.**

PROVISIONAL CHAIRMAN : J.C.L. TRAIN, C.B.E., M.C.,
MEMBER OF THE BRITISH TRANSPORT COMMISSION,
MEMBER OF THE PERMANENT COMMISSION OF THE ASSOCIATION.

— The meeting opened at 9 a.m.

**The President.** — Gentlemen, the Parmanent Commission has honoured me in conferring upon me the presidency of Section I for the London Congress, and it gives me very great pleasure to take the chair and conduct our discussions on these interesting Questions. *(Applause.)*

As *Vice-Presidents*, I propose to elect :

M. J. DE AGUINAGA, Director General de Ferrocarriles, Tranvias y Transportes por carretera (Spain), member of the Permanent Commission of the Association;

M. A.M. RIZK, Directeur Général des Chemins de fer de l'Etat Egyptien, member of the Permanent Commission of the Association;

Dr. M. SCHANTL, Secrétaire Général des Chemins de fer fédéraux autrichiens, member of the Permanent Commission of the Association, and

M. J. LOHMANN, Chef du Service de la Voie et des Travaux des Chemins de fer Néerlandais,

and as *Principal Secretary :*

M. J. DUBUS, Chief Engineer at the General Direction of the Belgian National Railways. *(Marks of approval and applause.)*

— The Section on the President's proposal subsequently completed its Bureau and drew up a provisional agenda.

## Revision of the Rules and Regulations of the International Railway Congress Association.

**The President.** — Gentlemen, before we commence our discussions on Question I, we have to designate a delegate of our Section to participate to the works of the Special Commission dealing with the study of a proposal of alteration of the Rules and Regulations of the Association (1).

I suggest to you, Gentlemen, the name of M. Robert LÉVI, Directeur des Installations Fixes de la Société Nationale des Chemins de fer français, who is willing to serve on that Committee. *(Agreed with applause.)*

— *The Section then started the examination of Question I.*

(1) For the text of the proposals of alteration of the Rules and Regulations, see page 989 of the *Congress Bulletin* for September 1954 (Summary of the proceedings of the London Congress of 1954).

[ 625 .17 ]

## QUESTION 1.

**What are the present tendencies relating to the organisation of the maintenance of the permanent way : methods of determination of the works to be done and in particular, possibilities of the use of detecting-recording coaches ; planning of the works, effects of mechanisation ; importance of the side-tracks for the movement of the gangs and the mechanical devices.**

### Economic and financial aspect.

#### Preliminary documents.

Report (America (North and South), Australia (Commonwealth of), Burma, Ceylon, Denmark, Egypt, Finland, India, Indonesia, Irak, Iran, Republic of Ireland, New Zealand, Norway, Pakistan, South Africa, Sweden and the United Kingdom of Great Britain and Northern Ireland and the territories for whose international relations the United Kingdom is responsible), by O. Hjelte CLAUSSEN. (See *Bulletin* for August 1953, p. 471, or separate issue No. 1.)

Report (Belgium and Colony, France and French Union, Greece, Italy, Luxemburg, Netherlands, Portugal and Colonies, Spain, Switzerland, Syria and Turkey), by C. FEYRABEND. (See *Bulletin* for December 1953, p. 993, or separate issue No. 15.)

Report (Austria, Bulgaria, Czechoslovakia, Hungary, Poland, Rumania and Yugoslavia), by Dr. Ing. habil. G. SCHRAMM. (See *Bulletin* for March 1954, p. 269, or separate issue No. 21.)

*Special Reporter :* Dr.-Ing. habil. G. SCHRAMM. (See *Bulletin* for May 1954, p. 499.)

## DISCUSSION BY THE SECTION.

### Meeting held on the 20th May 1954.

PRESIDENT : J.C.L. TRAIN, C.B.E., M.C.

— The meeting began at 9.15 a.m.

**The President.** — Gentlemen, I will ask Mr. DUBUS, *Principal Secretary*, to read the Summaries of the Special Report. Mr. GLENDINNING, District Engineer, Eastern Region, British Railways, *Secretary*, will then read the English Summaries.

*Summary 1 :*

1. The maintenance work of the length gangs varies in different Railway systems according to circumstances such as climate, density of population, wages, social and economic conditions, cost of materials, living standards, etc.

**M. Dubus** (in French). — As you see, this simply is a recognition of fact.

**The President.** — Agreed? *(Approved.)*

*— Summary 1 was adopted without modification.*

*Summaries 2, 3 and 4 :*

**M. Dubus.** — Gentlemen, you will see when they are read that summaries 2, 3 and 4 are in fact a whole. Summaries 2 and 3 refer to the gangs organised in small sections; summary 4 deals with longer sections.

Consequently, I think it would be as well to join these three summaries so that the question of gangs for long and small sections can be discussed together.

*Summary 2 :*

2. Until recently the permanent way gangs have generally been organised as short length gangs responsible for the entire maintenance work of the track length in question (supervision, maintenance work proper, as for instance levelling, lining, gauging, weed-killing, etc.) and various other works of local character, such as relief of permanent level crossing keepers.

*Summary 3 :*

3. If the situation due to the development of other kinds of transport has reduced the traffic on certain secondary lines, the fight against such competition had led, in order to reduce the working costs, to run over most other routes heavier and heavier wagons hauled by engines on which the weight on the driving axles has tended to increase more and more, whilst the actual speeds have become higher and higher.

*Summary 4 :*

4. Especially in countries where increasing wages have made it necessary to get the very most out of the working power, trials have successfully been started with longer gang lengths or with mobile gangs in connection with reduced local gangs.

The introduction of such gangs permits :

*a*) the reduction of the number of gangers as well as of the supervision personnel and better organisation of the work;

*b*) the extension of mechanisation;

*c*) the specialisation of the gangers;

*d*) the production of more uniform and probably more durable work;

*e*) the greater ability for the gang to carry out major items of track work.

**Mr. Glendinning,** *Secretary*, when reading in English Summary 4, suggested to replace the words « working power » by « manpower ».

**The President.** — I call upon M. Robert LÉVI.

**M. R. Lévi,** *Société Nationale des Chemins de fer français* (in French). — Mr. President, Gentlemen, I think that these three summaries call for various observations. There are some questions of detail to which I may perhaps return later, but there are also questions of principle which may lead us to modify considerably the wording — and perhaps even the organisation — of these proposed summaries.

First of all, I note that the proposed Summary 3, in its present form, does not

correspond to the programme laid down in the title of the question which we are discussing.

The question concerns present tendencies as regards the organisation of permanent way maintenance; for my part, I do not think any useful purpose is served by mentioning the running of heavier wagons and the increased loads of driving axles.

On the other hand, instead of this proposed wording for Summary 3, there might be some other useful information to be given, closely bound up with the subject. I will make a suggestion about this later.

If you will allow me to make a few more general remarks, I would like to say that in Summary 4, it is stated that it is due to difficult economic conditions that certain Railways have been led to consider the mechanisation or proper organisation of their maintenance gangs.

This is a point I feel I should go into.

I hope the Section will agree with me that it is desirable to state that the railways have not waited until they were in a difficult position before reducing their costs. I would like to insist upon this point because in Dr. SCHRAMM's final report I have read several times the statement that the Administrations have made great efforts to improve their organisation because they found themselves in a unbalanced financial position. On page 5 (1) we find : « ... the administrations must endeavour to regain such equilibrium and adapt themselves to the limited funds available. They are endeavouring to do this by making certain modifications in the organisation of permanent way maintenance work and by extensive mechanisation of the work. »

Further, on page 8, I see the following remark : « The increasing financial difficulties of the railways however obliged them to give up this methodical overhaul and to limit overhauls to the absolutely indispensable, etc. »

I think it is important for our Section to take sides on this point. If you will allow me, I will give you some further details which show that it is in fact the richer railways which have made the greatest efforts to improve their financial position.

If you like, I will end by giving you a few examples of this.

To take examples relating to France, here are several improvements which I am going to mention, introduced to Railways which at that time showed a favourable balance : chemical weeding of the permanent way (which dates from 1924); the use of machines for the mechanical renewal of the permanent way (which dates from 1928). Both these were introduced on railways which had surplus receipts in France and were not in the red.

More recently, measured shovel packing, due to M. LEMAIRE, was introduced on a railway in a relatively sound financial position.

If you want to find some examples outside France, you only have to consider the American railways. I would stress therefore that it is not technical reasons which have led certain railways to improve their organisation but economic reasons : when I mentioned chemical

(1) See *Congress Bulletin*, May 1954. p. 503/5.

weed killing, mechanical reneval, and measured shovel packing, the problem was to reduce labour costs.

**The President.** — I would suggest that this question will best be settled by a small committee set up to draft a new text of Summaries 2, 3 and 4, in agreement with the exchange of views which has just taken place. Then, tomorrow morning, we could continue the discussion of this question and we will have a final draft of the new items on which the Section can decide.

Do you agree this suggestion, M. LÉVI?

**M. R. Lévi** (in French). — If the President thinks there is time for us to exchange a few preliminary points of view, it might be a good thing if some of us mentioned the tendencies which they would like to see included in the new text.

**The President.** — These items are, therefore, still open for discussion.

**Prof. Dobmaier,** *Deutsche Bundesbahn.* (In English, then in German). — I quite agree with M. LÉVI. I would like the advantages and also the drawbacks of using private firms for permanent way maintenance work to be more definitely brought out in summary 2.

**M. Portmann,** *Swiss Federal Railways* (in French). — I would like to support M. DOBMAIER. In fact, I consider that making use of private firms for certain well defined work on a certain scale may be of real economic benefit for the railway, especially when it is question of concentrating the maintenance work into a few months and it is worth to find work for the men during the winter.

This method is widely used on our system, not only for renewals but also at times for systematic maintenance. This was a point I wanted to make and I should be very glad if it could be mentioned in summary 4 by the insertion of another phrase.

**The President.** — Any other speakers?

**M. Lohmann,** *Netherlands Railways* (in English). — I would like to complete item 2 as follows : « The maintenance of the permanent way has gradually grown, thanks to mechanisation, to a special branch in which the labourers must be trained carefully. In this connection, therefore, it is not good that these people will be charged with duty on posts. That is why all posts are to be removed from the Way and Works to the station sector. »

It is an economical necessity to keep the number of lengthmen as small as possible, and to divide them as well as possible over the network according to a calculation of the strength of the gang.

This calculation has to reckon with maximum speed, passing day tonnage, superstructure system, ballast bed, train frequency, traction form, subsoil and presence of gradients, curves and level crossings.

In Holland since a year a new calculation has been introduced with great success, for the number of lengthmen has been decreased by 10 %.

The strength of a gang may not go down below 6 men. If this would be the consequence of the calculation the gang section has to be lengthened in that case. Time studies made clear that working with mechanical tools, the most useful effect is reached with 8 to 12 men, whereby several necessary elaborations are carried out separately.

In order to reach the number of 12 men there are several methods namely combination of 2 gangs or formation of a crack (special) gang per district of a permanent way inspector.

**M. R. Lévi** (in French). — I would like to make a suggestion, and that is that we should restrict ourselves for the moment to remaking the paragraphs of Summaries 2 and 3, since Summary 4 will have to be gone into at length, as M. Lohmann has just shown.

As regards Summaries 2 and 3, this is what I suggest. I do not put it forward as the final solution, but in order to ascertain if the Section as a whole would agree to this way of putting things.

In the case of Summary 2, there is not much to alter beyond being more precise as to what is meant by « small gang » because certain railways seem to mean gangs of 4 or 5 men when they are talking about small gangs, and others gangs of 3 or 4 men. So we should make it clear that by a « small section gang » is meant the gang of 4 or 5 men.

As for the next point, I would suggest the following : « The burden involved in obligations to provide keepers for level crossings, as well as accommodation difficulties in large towns, has hampered the constant efforts of the Administrations to reduce the number of men employed in permanent way maintenance work. »

This — I would stress — is to make it quite clear that the railways have always endeavoured to reduce the number of men, and secondly that the trouble has always been to assure replacement of level crossing keepers and accommodation difficulties.

**The President.** — Does any one else wish to speak?

**M. Renda,** *Italian State Railways.* (in French). — I agree with M. Portmann as regards Summary 4, in connection with the use of mobile gangs of platelayers. I consider that thanks to contractors whom we make considerable use of, it is possible to reduce the time taken to carry out the work, and it is possible to get the work done by contract. By this I mean a reduction in the time taken to do the work as well as a reduction in the number of men engaged on the work.

**The President.** — Gentlemen, I would suggest a Drafting Committee be constituted to examine and draw up the new text for Summaries 2, 3 and 4.

Presided over by M. Robert Lévi, this Committee would be, if you agree, composed of 4 members, i.e. Messrs R. Lévi, Schramm, *Special Reporter*, Lohmann and Smith, *(Committee of Honour of the British Organising Commission)*.

Do you agree to this proposal? *(Approved)*

Therefore, we will proceed with the examination of the next Summary.

*Summary 5 :*

5. The determination of the maintenance works to be done has for many years generally been based on :

*a*) the experience of the durability of the work under the local conditions involved (predetermined cycles). This depends partially on an estimate and can vary much from place to place;

*b*) the very careful examination in the field of the track (systematic surveys). These surveys are complicated and take much time;

*c*) the appearance of trouble in the track. When this takes place defects may be so developed that they are beyond repair.

**M. Quéron**, *French National Railways* (in French). — I have only a small remark to make about Summary 5 on a question of detail. This relates to paragraph *c*). I wonder if the last sentence of this paragraph, which states that « When this takes place defects may be so developed that they are beyond repair» could not be included at the beginning of Summary 6 where it is noted that « After recognising the insufficiency of the stitch in time method... » It is precisely because at this moment the defects may be beyond repair.

**M. Dubus.** — Perhaps you could let us have a text for to-morrow morning's meeting which would include the last sentence of paragraph *c*) of Summary 5 in Summary 6? *(Agreed.)*

**The President.** — Subject to this alteration, may we consider the text of Summary 5 as approved? *(Agreed.)*

*Summary 6 :*

6. *a*) After recognising the insufficiency of the « stitch in time » method for assuring the proper condition of the permanent way, certain railways have adopted a general overhaul method covering the whole system, which is unnecessarily costly.

The introduction of methodical maintenance covering a periodic general overhaul and a limited overhaul to deal with level, especially at the joints, and tightening up the fastenings, has resulted in considerable savings, especially from the labour point of view.

*b*) The necessity for maintenance operations is no longer based on a simple estimate of the actual condition of the track, but chiefly on an estimate of the probable rate at which it will wear.

There will be considerable saving due to the reduced mileage to be dealt with, a better definition of the elementary work, and a reduction in the number of intermediate overhauls.

**M. Dubus.** — It is understood that the first sentence of this Summary 6 will be modified by our French colleague M. QUÉRON in the following way :

« After recognising the insufficiency of the « stitch in time » method for assuring the proper condition of permanent way *because when work is put in hand the faults may well have reached a stage where they are irreparable*, some systems have adopted a general method of overhaul applicable to the whole of the system which is too onerous. »

The remainder will not be changed.

Does the meeting agreed to this summary with the above alteration?

**M. Quéron** (in French). — I think it would be better to divide the wording of this summary not into two paragraphs — *a*) and *b*) — but into three paragraph *a*), *b*) and *c*).

The first paragraph would remain; paragraph *b*) would begin by the sentence : « The introduction of methodical

maintenance... » and paragraph *c*) would be as follows : « The necessity for maintenance work is no longer based... »

It seems to me that the value of these three ideas would stand out better if they were separated and given under different letters.

**M. Julien,** *Ministère des Travaux publics, des Transports et du Tourisme, France* (in French). — It seems to me that in paragraph *a*) of Summary 5, the expression « experience of the *durability* of the work... » should be changed, as this is in fact defective.

**M. Dubus** (in French). — Perhaps M. Julien could suggest another wording to-morrow? *(Agreed.)*

**The President.** — Can Summary 6, modified as suggested be considered as adopted? *(Agreed.)*

*— The revised text of Summaries 5 and 6 will be submitted to the meeting on the 24th May.*

*Summary 7 :*

7. Recording vehicles, particularly those which give an exact position of each rail in the vertical and horizontal planes and their exact gauge, give invaluable services from this point of view, with regard to the factors to which they are sensitive. By the comparison of successive recordings they make it possible to follow the evolution of the condition of a given line.

The use of recording vehicles is of very great economical value, because it permits the maintenance work to be done exactly on the right spot and just at the right moment, with consideration to the track-standard of the entire railway system.

**M. R. Lévi** (in French). — I am wondering if the word *exact* is not rather too precise. I think the special reporter's meaning was that the interesting vehicles are those showing the actual position of each rail. True? Is it to one hundreth of a millimetre? I do not think so. We might say : the *real* position.

**Mr. Glendinning.** — I suggest that we just say « the position ».

**The President.** — Do we agree to the proposed alteration? *(Agreed.)*

*Summary 8 :*

8. As well for economic as for technical reasons it is of the greatest importance that planning of maintenance works be done under close collaboration between maintenance and operating officers to establish appropriate speed restrictions or the diversion of traffic to other lines or tracks, with due consideration to the traffic and to the type of work involved.

**M. R. Lévi** (in French). — The Enlarged Meeting of the Permanent Commission has already given its views on this point, at Lisbon in 1949, and very clearly.

As in a following summary reference is made to the summaries of the Enlarged Permanent Commission at Lisbon, perhaps the same could be done in the case of Summary 8.

**M. Dubus.** — Yes.

**M. R. Lévi.** — This is what the Section said at the Enlarged Meeting of the Permanent Commission :

« The maximum output of mechanised equipment for cleaning and screening the

ballast, and the removal and replacement of the track, is obtained when it is possible to take advantage in long gaps in the running of trains. This practice allows of a speeding up of relaying operations, of a reduction in the delay in carrying them out in one section of track, in short, to reduce the expense of all services and particularly the expense of slowing up traffic. »

I think this text is even clearer than that of Summary 8; under these conditions, the question could be referred in the same way.

**The President.** — Is that agreed, that we take into consideration the conclusions adopted at Lisbon by the Enlarged Permanent Commission? *(Agreed.)*

*— The new text of Summary 8, in its final form, is given hereafter in the Meeting of May 24.*

*Summary 9 :*

9. The mechanisation is especially advantageous with larger gangs and contributes greatly to the success of the above mentioned trials. In no case must the constitution of these gangs involve undue movement of the personnel from place to place.

To get the best results from the use of mechanical tools supervisors and operators must be well trained in their use and daily maintenance.

**M. Hédayat,** *Iranian State Railways* (in French). — I would like to know if what is said in this summary is true, where the labour question does not constitute a problem with regard to salary and availability. In fact, those countries where labour is available and not expensive and lacks the necessary experience for mechanisation, accept this text when they cannot fulfil the conditions required for mechanisation? It seems that the summary does not give sufficient mention to those special questions which arise in certain countries regarding the cost of labour and its technical knowledge.

**M. R. Lévi** (in French). — I have listened with interest to what our Iranian colleague has said and may add that it is more or less in line with what I was going to say.

This summary contains two sorts of ideas, on the one hand, the value of mechanisation, and on the other hand, the precautions to be taken to make full use of the advantages of mechanisation.

The first of these two points, in my opinion, is rather close to that of Summary 4, for which reason I am going to suggest that we retain that part of Summary 9, which should be included in the new Summary 4. We will say, for example, that the expansion of mechanisation depends upon demographical questions and the size of the gangs. I think this is an essential point.

If the President agrees, this question can be gone into by the small Drafting Committee which is going to reconsider the text.

**Lt Col. Wilson,** *Ministry of Transport and Civil Aviation, Great-Britain.* — There is one point only I would mention, a minor drafting point in item 9. Where it says : « ... contributes greatly to the success of the above mentioned trials. » In English the word « trial » rather suggests experiment. It is not quite the

same as the French word « essais », and I suggest it should be changed to « ... the above mentioned operations ».

**The President.** — Agreed to change in the English text just the word « trials » for « operations. »

**M. Dubus.** — This summary will be considered by the Committee and examined in conjunction with Summary 4.

*Summary 10 :*

10. The final summaries adopted at the Enlarged Meeting of the Permanent Commission (Lisbon, June 1949) mention the paths for the movement of the men and machines as follows :

« It is desirable in future in the case of new railway construction or when modifying existing lines to provide large cesses to facilitate the use of mechanical equipment and generating plant. »

Besides this, the existence of such paths is also very desirable for the safety of the men, because in a large measure they reduce the movement of men to and from their place of work on the track.

— *Adopted without comment.*

**The President.** — I would suggest that as the sub-committee is going to re-draft Summaries 2, 3 and 4, and Summary 4 of course is a very important question from the economic point of view, that we will leave Summaries Nos. 11, 12, 13 and 14 until tomorrow's session, as we have done very well and have plenty of time to discuss these and see if there is anything we want changed.

Is that agreed then? *(Approved.)*

We will now adjourn, and the sub-committee will attend to these questions which M. Dubus has mentioned, and we will meet again at 9 o'clock tomorrow morning. Thank you gentlemen.

— The meeting adjourned at 10.35 a.m.

## Meeting held on the 21st May, 1954.

PRESIDENT : J.C.L. TRAIN, C.B.E., M.C.

— The meeting commenced at 9 a.m.

**The President.** — Gentlemen, the Drafting Committee constituted yesterday met after the meeting and has drawn up a new text for the Summaries, which it was decided, had to be redrafted, as well as a new draft for Summaries 9 and 12, also partly altered.

**M. Dubus.** — Here is the new text for Summaries 2, 3 and 4 as drawn up by the Drafting Committee under the presidency of M. R. LÉVI. We hope the meeting will approve, especially those members who wanted further light thrown upon the questions dealt with.

*Summary 2 :*

« 2. Up to the last year or two, length gangs were generally organised in small gangs (4 or 5 men) responsible for all maintenance work on the length in

question (inspections, maintenance work proper, as for instance levelling, lining, gauging, weedkilling, etc.) and various other work of local character such as relief of permanent level crossing keepers.

« The burden arising from these tasks, as well as lodging difficulties and transport of personnel, make it difficult for the administrations to realise a reduction in the manpower employed in day to day track maintenance. »

*Summary 3 :*

« 3. Railway administrations endeavour to reduce to a minimum track maintenance costs with due consideration to the necessity of carrying a constantly increasing speed and weight of traffic in comfort and security. »

*Summary 4 :*

**M. Dubus.** — In the case of Summary 4, M. R. LÉVI when preparing the new text was led to subdivide it in order to meet as far as possible the wishes expressed yesterday by certain delegates for further information.

It should be noted that this new text, at least to some extent, also concerns Summaries 9 and 12, which will have to be taken into account in the discussion.

Here is the text suggested by the Drafting Committee :

« 4. (i) Especially in countries where increasing wages have made it necessary to get the very most out of the manpower, trials have successfully been undertaken in which the following two fundamental tendencies appear :

« (*a*) the search for an improvement in overall productivity by the concentration of personnel in longer gang lengths with a strength of at least 8 men, or by the use of mobile gangs in conjunction with reduced local gangs.

« (*b*) the search for an improvement in individual productivity by the use of motorised tools which allow of the same individual carrying out more easily some more important works. »

« 4. (ii) The solutions agreed should allow of :

« (*a*) the reduction in the overall number of gangers and a better organisation of the work;

« (*b*) a greater continuity and more clearly defined tasks allotted to each ganger;

« (*c*) the production of more uniform and probably more durable work;

« (*d*) the carrying out of relatively important track work may fall within the scope of private enterprise. »

« 4. (iii) The economic and density of population factors have an important influence on the predominance accorded to one or the other of the tendencies in the solutions applied : each of them having, moreover, its limits of application. The same factors can tend to increase or reduce that part of renewal of track let to contract. »

« 4. (iv) Concentration allows the management to follow more closely the work carried out by the gang. On the other hand, the social advantages of personnel returning each evening to their homes should not be overlooked. This is a question to which the men, in general, attach great importance.

« Mechanisation is already largely applied to major renewals in connection with which the question no longer arises. For the smaller works of day to day maintenance its application should be more carefully considered. It necessitates a very precise application of the works to be done in order to avoid unnecessary operations.

« To get the best result from the use of mechanical tools supervisors and operators must be well trained in their use and daily maintenance. »

**The President.** — The discussion is now open.

**M. Julien** (in French). — In the second paragraph of Summary 2, I suggest replacing : « ... against the *constant tendency* of the Administrations in order to reduce... » by « the *constant efforts* of the Administrations in order to reduce... »

Then, in Summary 4, paragraph *a*) we should say : « the search for improvement in overall productivity by the concentration of personnel into *gangs working over longer sections...* » instead of « the concentration of personnel into *longer sections...* etc. »

**M. Dubus.** — The French text will be modified in this way; we will retain the English wording, as it expresses the idea M. JULIEN has in mind.

**M. Masseron,** *Compagnie Fermière des Chemins de fer tunisiens* (in French). — In Summary 4 (ii), it states : « The solution adopted should allow of *a*), *b*), etc. » It seems to me that in order to take into account what is said in 4 (iv) where it is stated that the work to be done must be very accurately determined, etc., this Summary 4 (ii) should be completed as follows : « The solution adopted *should be based on the preliminary determination of the work to be done and allow of...* »

Savings can in fact be made in determining the work to be done as a preliminary.

**M. Feyrabend,** *Reporter* (in French). — I think the wording should be left as it is since the object in view is defined in 4 (ii) whilst the idea suggested is the means. Now, the means are gone into in the following paragraphs, where the factors in play are defined. This is one special view of the question. In my opinion, 4 (ii) should be left as it is.

**M. Dubus.** — Do you agree that the text should be left as it is, after M. FEYRABEND's explanations? *(Agreed.)*

**M. Feyrabend** (in French). — I think it would be a good thing to add in the last paragraph of Summary 2 : « The burden arising from these tasks, ... » the word : « last ». The text would then read : « The burden arising from these last tasks... » This should be specified since it is just this supplementary work which upsets the organisation. By saying « The burden arising from these tasks... » it appears to mean all the maintenance work.

**Mr. Glendinning.** — I think the English text is quite clear. The words « these tasks » cannot mean anything else.

**The President.** — The French text will be modified in this way. The English text will remain unaltered.

**Mr. Sood,** *Indian Government Railways.* — In paragraph 2 a small gang has been defined as between 4 and 5 men. I would suggest that this figure should not be limited. It is not correct to say 4 or 5 men in our country.

**M. Quéron,** *French National Railways* (in French). — What M. FEYRABEND said just now about paragraph 2 of Summary 2 leads me to make another suggestion. I note that supervision also plays its part in the difficulties the Administrations find in reducing their maintenance staff, so that I ask that the word : *supervision* be suppressed where it is, and now be put at the end of the paragraph after the words in parentheses, so that the text will read as follows : «... as well as *supervision* and various other tasks... »

The second paragraph of this Summary 2 would then read : « The burden resulting from *these last tasks* and from *supervision*, as well as the difficulties, etc.»

**M. R. Lévi** (in French). — After the statement made by our colleague from India, Mr. SOOD, I suggest replacing the words in parenthesis « 4 or 5 men » by : *less than 6 men.* This would meet our colleague's wishes.

**The President.** — Is that agreed : « less than six men »?

**Mr. Sood.** — Yes, that is all right.

**M. R. Lévi.** — I will return to another point regarding the wording in order to satisfy M. RENDA. At the end of paragraph 1 of Summary 2 it says : « ... other work of a local character, *like* replacing the permanent keepers. »

I think that the text would be clearer if we said : « ... other work of a local character, *such as* replacing... » It is just a shade different.

**M. Vejlö,** *Danish State Railways* (in French). — In certain places you mention 4 or 5 men for the gangs, in others 8. We think it would be better not to give any actual figures because the sections differ from country to country and may be longer or shorter. In our opinion, it is quite useless to give any figures.

**M. R. Lévi.** — It is a point which seems important to me so that the summaries of the Congress may have the air of being summaries.

**M. Vejlö.** — In our case, it is a different question, we might have trouble with the Unions which might say that a small gang was a gang of 4 or 5 men, or of less than 6 men. In Denmark, we usually have only 3 men in a small gang, and we would not like the Unions to take their stand on the summaries adopted at the Congress here.

**M. R. Lévi.** — Mr. President, I think there is a misunderstanding. In fact, just now, I proposed suppressing the statement *4 or 5 men* and replacing it by *less than 6 men.* I think our Danish colleague should be satisfied with this new wording.

**M. Vejlö.** — We find it a bit dangerous, even to say : « less than 6 men ».

**M. Dubus.** — I think we are agreed in looking for a compromise. We will leave the matter on one side, as the figures are given in the *Congress Daily Journal*, those interested in a figure can always refer to the Journal.

I understand very well — I excuse myself for speaking personally — Mr. LÉVI's idea; he wanted to be quite precise, but here I suggest leaving the wording obscure as one may always refer to the *Journal*.

**The President.** — We will leave it out of our conclusion and keep it in the journal, if that is agreed.

May we take it that you are in accord with Summaries 2, 3 and 4, in which case we will then proceed to Summary 10.

— *Items 2, 3 and 4 were approved The final text will be submitted to the Meeting of May 24.*

**M. Julien.** — Here is the wording I would like to suggest for Summary 5 *a*) replacing « experience of the *durability of the work...* » by « experience of the *probable duration of the results of the work* under the conditions... ».

*Summary 10 :*

**Dr. Schramm,** *Special Reporter* (in German). — In Summary 10, in connection with the mention of footpaths, I would like some mention to be made of the masts carrying the overhead line, stating the difficulties they occasion in making and maintaining the footpaths.

**M. Quéron** (in French). — I think it is a question of deciding whether in the case of electrified lines, the catenary posts should be placed on one side or other of the path. I think this is what is being suggested?

**M. Dubus.** — They should be so placed that the paths are kept as clear as possible. We all know that in many cases this is not so.

**M. R. Lévi** (in French). — I think I am right in interpreting Dr. SCHRAMM as meaning that the essential is to maintain the continuity of the path when a new electrification is being undertaken. *(Dr. Schramm assented to this.)*

**M. Dubus.** — We might make the following addition to Summary 10 : « It is essential to maintain the continuity of the path when electrification is being carried out. »

**M. R. Lévi** (in French). — « It is useful » or « it is desirable ».

**The President.** — « It is desirable », we could say in the English text. We would have a sentence beginning, « It is desirable in future cases, etc. »

**M. Dubus.** — That's it : « It is also desirable. »

**The President.** — Any other remarks?

— *Adopted.*

*Summary 11 :*

11. The factors in the evolution of maintenance : concentration of the gangs, organisation of the work and mechanisation, are

capable of giving considerable economies compared with the present position; however, each of them has limits to its application.

**The President.** — Does everyone agree on the wording used by the Special Reporter?

**M. R. Lévi** (in French). — In French, the word *considérables* seems rather an exaggeration, I would merely say : « des économies *notables.* »

**The President.** — No, that is not correct. We would not say that in English.

**Mr. Glendinning.** — It is a matter of the English translation. It is whether you think « considerable » the right word or not. « Certain economies », perhaps?

**The President.** — Yes, I have no objection to the use of « certain economies » although I would prefer to retain « considerable ». Perhaps one of the British delegates would express an opinion?

**Mr. Smith.** — I suggest we keep the word « *considerable* ».

**The President.** — Agreed, yes we will keep the word « considerable » in the English text.

**M. R. Lévi** (in French). — I would like to make another observation.

In Summaries 11, 12 and 13, mention is made of certain advantages of modernisation and concentration, and this is repeated in a not very harmonious way, which is why I would like to suggest, Mr. President, that we should consider Summary 13 and if necessary rearrange it.

*Summary 12 :*

12. Concentration enables the management to follow more closely the work of the gangs. It soon loses its advantages, however, owing to the high cost of travelling and lodging when the gang becomes too large and works over such a wide area that the men can no longer return home at night. The social advantages of returning home at night are, however, extremely important.

*Summary 13 :*

13. Mechanisation gives a great increase in individual output, though the saving on the work as a whole is less. The saving decreases very rapidly when the amount of work to be done is small and when the traffic on the lines in question is considerable. It requires very careful predetermination of the work to be done to avoid useless operations.

*Summary 14 :*

14. The general applications of the new methods will only be crowned with success when the managerial staff is so trained that it knows the possibilities and limitations of these methods as well as its role in the economies which must result from their application.

**Prof. Dobmaier.** — In paragraphs 11, 12 and 13, it is written about the factors in the evolution of maintenance, organisation of work, and so on, but I think that a question of principle has been forgotten as the evolution of maintenance depends also on the construction and

of the material, perhaps on the kind of ballast, on the kind of sleepers, and I want to mention only generally that it is depending on the kind of material.

**M. Swartling,** *Swedish State Railways.* — It is stated in Summary 13 : « Mechanisation gives a great increase in individual output, though the saving on the work as a whole is less. » It says here that when one mechanizes a thing it would be a less saving. I do not think that the wording is perfectly clear, so I would suggest the following alteration : « Mechanization gives a great increase in individual output, though the percental saving on the work as a whole is less than that of the individual output. »

**M. R. Lévi.** — Mr. President, before examining the point raised by our Swedish colleague, I would like to return to what I said just now about Summaries 11, 12 and 13 as a whole.

We clearly appreciated, for example, that the alterations we made to Summary 4 involves the alteration of Summaries 11, 12 and 13. After examination, it appears that they could be condensed into a single summary which I will now read you if you agree. *(Agreed.)*

Here is the wording we suggest for Summaries 11, 12 and 13, which will now form a single summary :

« The factors in the evolution of maintenance : concentration of gangs, organisation of work and mechanisation... » thus grouping them all together,

« ... are capable of yielding considerable economies as compared with present methods, however... »

here, we subdivide :

« — the economic advantages of concentration decrease when high costs are involved in the transport or lodging of a gang, when their area of work is greater than can be covered by the men on foot;

« — if mechanisation leads to an increase in individual output, the total reduction in cost is less. »

This corresponds more or less to the idea of our Swedish colleague.

« It decreases rapidly with the amount of work and when the traffic on the lines concerned is heavy. »

We have tried to sum up all the ideas corresponding to the economic influence of the concentration of gangs, the organisation of the work and mechanisation, relating the advantages and drawbacks, in a single paragraph.

**M. Dubus.** — Do you agree?

**The President.** — Gentlemen, I suggest that we adjourn for half an hour, and in the meantime the translation will be made into English.

The meeting adjourned from 10.10 to 10.40 a.m.

**The President.** — Gentlemen, we will continue our meeting. I would ask M. DUBUS to read you the new wording of the summaries.

**M. Dubus.** — M. LÉVI has also asked me to read the text which he suggests for the last summary, summary 14, so that we can see how the whole text will appear.

*Summaries 11, 12, 13 :*

« The factors in the evolution of maintenance : concentration of gangs, organisation of work and mechanisation, are capable of yielding considerable economies as compared with present methods. Nevertheless :

« — the economic advantages of concentration decrease when high cost is involved in the transport or lodging of a gang when the area is greater than can be covered by the men on foot;

« — if mechanisation involves an increase in individual production, the total reduction of costs is less; it decreases rapidly with the amount of work in hand, and when the traffic on the lines involved is considerable. »

*Summary 14 (slightly altered) :*

« The general application of the new methods will only be crowned with success when the managerial staff fully understand the possibilities and limitations of these methods and how to take full advantage of the economies which it is hoped will result from their application. »

*Summary 15 (new) :*

« The replies received from the various Administrations cover all the methods applied to standard track maintenance.

« Present progress in the technique of the composition of the track (elimination of joints) and with regard to the material used (increase in the life of sleepers) will allow, if present hopes are realised, of effecting a considerable reduction in recurring items of maintenance. The labour strength necessary for maintenance work proper will certainly be reduced and new composition of length gangs will need to be studied.

« The question of extraneous duties (inspection and obligations in connection with level crossings in particular) should form the subject of special study because it will become increasingly impossible to burden length gangs with such work if their output is not to be affected. »

**The President.** — I am sorry that these revised texts have not been circulated in French and English and you have had to listen to them only, but, of course, they will be printed in the *Congress Journal* and I propose that we devote possibly two days to Question 2 and there will still then be a third day to, what we shall say, polish up, so that if we have any comments now on what has been made we can hear them. On the other hand, you will have a second opportunity of commenting on the third day next week before these are finally adopted.

There is just one word in the English translation which I think might be improved, that is the « constitution of the track »... Il anyone would care to suggest an alternative from among the British delegates? What about « composition? »

**Mr. Smith.** — I would suggest : « composition of the track ».

**The President.** — No remarks? *(Agreed.)*

**M. Julien.** — I suppose that Summary 15 covers in particular the use of

long rails with concrete sleepers, grooved soleplates and elastic fastenings?

**M. Dubus.** — That's right.

**M. Julien.** — Is this method of track laying used in any other country?

**M. Dubus.** — It has been described at length in the reports, especially in M. SCHRAMM's special report.

**Mr. Smith.** — I am not clear about Summary 14. It refers in the text to the « managerial staff », and I think the intention is to refer to « administrative » staff rather than to the workmen who are doing the work. If I am correct I would suggest it should be re-drafted :

« The general application of the new methods will only be crowned with success when the *administrative staff* fully understand the possibilities and limitations of these methods, and how to take full advantage of the economies which will result from their application. »

**Mr. Glendinning.** — « Administrative » staff would be better than « managerial » staff in the English text.

**Mr. Smith.** — I would prefer to use the word « administrative » staff.

**M. Feyrabend.** — To answer the question asked by Mr. SMITH, I would explain that by *managerial staff* we have understood the staff as from the district officer, the head of the section. The usual gang foreman is included with his gang; the engineer is included in the management; here we mean the managerial staff responsible for carrying out the work, starting with the district officer.

**The President.** — Yes, it is agreed then, in the English text we will say : « The general application of the new methods will only be crowned with success when the *administrative staff* fully understand the possibilities and limitations of these methods, etc. »

**M. Feyrabend.** — The French word is : chef de district.

**M. Dubus.** — We do not stop at the gang foreman; we go much higher.

**M. Feyrabend.** — Naturally.

**M. Dubus.** — *Administrative staff*, i.e. those who are responsible for the management of this department.

**Mr. Smith.** — Chief engineer or head of the department?

**M. Feyrabend,** *Reporter.* — All the hierachy. If you like we could say : « managerial and administrative ».

To answer M. JULIEN, who in connection with Summary 15 mentioned long rails with concrete sleepers, grooved sole plates and elastic fastenings, it is understood that this method of track laying is included in the second paragraph of Summary 15, which is intended to cover the future and all progress made, even I might say that of which we have as yet no inkling, which is under investigation or likely to be introduced to improve the material used.

Regarding paragraph 3 of Summary 15, I suggest the following modifications :

The future tense has been used to state : « The problem of supplementary

burdens (supervision and the obligations entailed by the existence of level crossings with keepers in particular) *should be* the subject of special investigation... » I think that the future tense is too restrictive as the problem already arises in our case. If we wish to help on the evolution towards less costly maintenance with smaller gangs, we must already consider reducing the supplementary costs. The text might be put into the present tense as follows :

« The problem of supplementary burdens (...) *must* be the subject of still *more thorough investigations...* » because this is a matter with which we are all concerned already... « as in practice it will be *less and less possible...* » i.e. it is already difficult but the easier the permanent way becomes to maintain, the more tiresome it will be to have to supply keepers for level crossings, etc. I return to the text : « ... as in practice it will become less and less possible to burden the maintenance gangs in this way if their output is not to be seriously reduced. »

**Mr. Sood.** — In the revised draft which was read out, paragraph 15 has been added regarding obligations in connection with level crossings. This is not a practical suggestion so far as my country is concerned. The stations are so far apart and it is not possible for the staff to be sent out for relief of the gates of level crossings.

I am afraid I could not agree this until I see the text of the new Summary 15.

**M. Dubus.** — Gentlemen, I think we are all in agreement concerning the PRESIDENT's suggestion; we can if necessary at the last meeting next week have a further exchange of views and polish up the text of the summaries we have just discussed. *(Agreed.)*

— The meeting rose at 11.10 a.m.

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## Meeting held on the 24th May 1954.

PRESIDENT : J.C.L. TRAIN, C.B.E., M.C.

— The Meeting began at 9 a.m.

**The President.** — Well, Gentlemen, if you will please be seated we will open the Meeting, and I will first ask M. DUBUS to read in French the revised summaries of Question 1, and after that Mr. GLENDINNING will read the same in English.

*Summary 1 :*

« 1. The maintenance work of the length gangs varies in different Railway systems according to circumstances such as climate, density of population, wages, social and economic conditions, cost of materials, living standards, etc. »

— *This Summary was adopted at the first meeting.*

*Summary 2 :*

« 2. Up to the last year or two, length gangs were generally organised in small gangs (less than six men) responsible for all maintenance work on the length in question (inspections, maintenance work proper, as for instance levelling, lining, gauging, weedkilling, etc.) and various other work of local character, such as relief of permanent level crossing keepers.

« The burden arising from these tasks, as well as lodging difficulties and transport of personnel, make it difficult for the Administrations to realise a reduction in the manpower employed in day-to-day track maintenance. »

In the second parentheses, of the first paragraph, the word « supervision » has been suppressed; further on, the words *such as* have at M. RENDA's request replaced the word *as*.

*Summary 3 :*

« 3. Railway Administrations endeavour to reduce to a minimum track maintenance costs with due consideration to the necessity of carrying a constantly increasing weight and speed of traffic in comfort and security. »

*Summary 4* (i) :

« 4. (i) Especially in countries where increasing wages have made it necessary to get the very most out of the manpower, trials have successfully been undertaken in which the following two fundamental tendencies appear :

(*a*) the search for an improvement in overall productivity by the concentration of personnel in longer gang lengths with a strength of at least 8 men, or by the use of mobile gangs in conjunction with reduced local gangs;

(*b*) the search for an improvement in individual productivity by the use of motorised tools which allow of the same individual carrying out more easily some more important works. »

*Summary 4* (ii)

« 4. (ii) The solutions agreed should allow of :

(*a*) the reduction in the overall number of gangers and a better organisation of the work;

(*b*) a greater continuity and more clearly defined tasks alloted to each ganger;

(*c*) the production of more uniform and probably more durable work;

(*d*) the carrying out of relatively important track work may fall within the scope of private enterprise. »

*Summary 4* (iii) :

« 4. (iii) The economic and density of population factors have an important influence on the predominance accorded to one or the other of the tendencies in the solutions applied : each of them having, moreover, its limits of application. The same factors can tend to increase or reduce that part of renewal of track let to contract. »

*Summary 4* (iv) :

« 4. (iv) Concentration allows the

management to follow more closely the work carried out by the gang. On the other hand, the social advantages of personnel returning each evening to their homes should not be overlooked. This is a question to which the men, in general, attach great importance.

« Mechanisation is already largely applied to major renewals in connection with which the question no longer arises. For the smaller works of day to day maintenance its application should be more carefully considered. It necessitates a very precise application of the works to be done in order to avoid unnecessary operations.

« To get the best result from the use of mechanical tools, supervisors and operators must be well trained in their use and daily maintenance. »

**M. Dubus.** — These summaries have been slightly altered to take into account the wishes expressed by certain delegates during the meeting of May 21.

**The President.** — Will the English speaking delegates please say if they will accept these revised terms.

**Mr. Smith.** — I am not quite sure whether you propose to retain the words « 6 men » in the permanent way gangs or whether you are going to delete the actual number?

**The President.** — That was discussed at our meeting, and it was decided by the majority that to meet the views of one or two delegates the words now appearing in the text would stand. Are you agreed? *(Agreed.)*

Then we will go on to Summary 5.

*Summary 5 :*

« 5. The determination of the maintenance works to be done has for many years generally been based on :

« (*a*) the experience of the durability of the work under the local conditions involved (predetermined cycles). This depends partially on an estimate and can vary much from place to place;

« (*b*) the very careful examination in the field of the track (systematic surveys). These surveys are complicated and take much time;

« (*c*) the appearance of trouble in the track. »

**M. Dubus.** — The first sentence of paragraph *a*) has been changed at the request of M. JULIEN. On the other hand, the second sentence of *c*) « At this moment the defects may have become so serious as to be irreparable » has been included in Summary 6.

*Summary 6 :*

« 6 *(a)* After recognising the insufficiency of the « stitch in time » method for assuring the proper condition of permanent way because when work is put in hand the faults may well have reached a stage where they are irreparable, some systems have adopted a general method of overhaul applicable to the whole of the system which is too onerous.

« *(b)* The introduction of methodical maintenance covering a periodic general overhaul and a limited overhaul to deal with level, especially at the joints, and tightening up the fastenings, has resulted in savings, especially from the labour point of view.

« *(c)* The necessity for maintenance operations is no longer based on a simple estimate of the actual condition of the track, but chiefly on an estimate of the probable rate at which it will wear.

« There will be important savings due to the reduced mileage to be dealt with, a better definition of the elementary work, and a reduction in the number of immediate overhauls. »

**M. Dubus.** — Do we agree to this text?

**M. Feyrabend** (in French). — Yes.

*Summary 7 :*

« 7. Recording vehicles, particularly those which give the position of each rail in the vertical and horizontal planes and the gauge, give in valuable services from this point of view, with regard to the factors to which they are sensitive. By the comparison of successive recordings they make it possible to follow the evolution of the condition of a given line.

« The use of recording vehicles is of very great economical value, because it permits the maintenance work to be done exactly on the right spot and just at the right moment, with consideration to the track standard of the entire railway system. »

*Summary 8 :*

**M. Dubus.** — As regards summary 8, M. Robert Lévi asked that the text put forward at the Enlarged Meeting of the Permanent Commission at Lisbon should be recalled. The new wording of this summary is therefore :

« 8. The question has already been considered in Summary No. 5 *(a)* of Question 1, Section I, of the Permanent Commission which met at Lisbon on 4th June, 1949, in the following form :

« The maximum output of mechanised equipment for cleaning and screening the ballast, and the removal and replacement of the track, is obtained when it is possible to take advantage in long gaps in the running of trains. This practice allows of a speeding up of relaying operations, of a reduction in the delay in carrying them out in one section of track, in short, to reduce the expense of all services and particularly the expense of slowing up traffic. »

**M. Dubus.** — If no one wants to say anything, this text is adopted. It will be included in our general Summaries in this form.

**M. Feyrabend** (in French). — I think that in reading the text of the summaries now put forward, it is not very clear after Summary 7 which deals with recording vehicles how we get on to Summary 8 which says « The question has already been dealt with... ». This seems to refer to the preceding paragraph, which is actually not the case I think.

Consequently, I suggest that the first paragraph of Summary 8 be preceded by the words : « *It is important that the preparation of maintenance and renewal work be carried out in collaboration with the operating.* The question has already been dealt with... etc. »

If we just say the question has already been dealt with, we do not know to what question we are referring.

**M. Dubus.** — Would you suggest a definite text?

**M. Feyrabend** (in French). — I will prepare a text with M. UNAL in a moment. We will submit it later on.

*Summary 9 :*

**M. Dubus.** — Summary 9 as given in the special report, by Dr. SCHRAMM, has been suppressed in view of the fact that the leading idea of this summary has been included in the new wording of Summaries 11, 12 and 13.

*Summary 10 :*

« 10. The final summaries adopted at the Enlarged Meeting of the Permanent Commission (Lisbon, June, 1949) mention the paths for the movement of the men and machines as follows :

« It is desirable in future in the case « of new railway construction or when « modifying existing lines to provide « large cesses to facilitate the use of « mechanical equipment and generating « plant. »

« Besides this, the existence of such paths is also very desirable for the safety of the men, because in a large measure they reduce the movement of men to and from their place of work on the track.

« It is equally desirable to maintain the « continuity of the « side paths » when « electrification is being carried out. »

**M. Dubus.** — The text of this summary has been completed by the addition of a paragraph which, I think, meets the wish expressed by Dr. SCHRAMM regarding the posts carrying the overhead lines.

**The President.** — I would suggest to consider the Summaries 11 to 15 together, and you will note that the numbers of these conclusions are to be revised when the new summaries are all agreed.

*Summaries 11, 12, 13 :*

« 11, 12, 13. The factors in the evolution of maintenance : concentration of gangs, organisation of work and mechanisation, are capable of yielding considerable economies as compared with present methods. Nevertheless

« — the economic advantages of concentration decrease when high cost is involved in the transport or lodging of a gang when the area is greater than can be covered by the men on foot;

« — if mechanisation involves an increase in individual production, the total reduction of costs is less; it decreases rapidly with the amount of work in hand, and when the traffic on the lines involved is considerable. »

*Summary 14 :*

« 14. The general application of the new methods will only be crowned with success when the administrative staff fully understand the possibilities and limitations of these methods and how to take full advantage of the economies which it is hoped will result from their application. »

*Summary 15 :*

« 15. The replies received from the various Administrations cover all the methods applied to standard track maintenance.

« Present progress in the technique of the composition of the track (elimination of joints), and with regard to the material used (increase in the life of sleepers) will allow, if present hopes are realised, of effecting a considerable reduction in recurring items of maintenance. The labour strength necessary for maintenance work proper will certainly be reduced and new composition of length gangs will need to be studied.

« The question of extraneous duties (inspection and obligations in connection with level crossings in particular) should form the subject of special study because it will become increasingly impossible to burden length gangs with such work if their output is not to be affected. »

**M. Dubus.** — Well there you have the revised text of the Summaries which sum up as far as possible the ideas expressed.

**The President.** — These Summaries are submitted to you for approval. Any questions on these Summaries?

**M. Feyrabend** (in French). — I would like to make a simple observation.

In the third paragraph of Summary 15 : « The problem of supplementary burdens.. » I asked that this should read : « The problem of extraneous duties (inspection and obligations in connection with the level crossings with keepers in particular) must therefore be studied *in greater detail* as it will be... etc. » This is to stress the fact that such investigations are already being made and many Administrations are dealing with this question.

**M. Ratter,** *British Railways.* — As regards Summaries 11, 12 and 13, I would suggest to alter the wording of the last paragraph to read as follows :

« The potential economies of mechanisation fall when the volume of work is small, or when traffic is considerable. »

**M. Feyrabend** (in French). — It is not necessary to alter the French text; the idea is the same.

**M. Dubus.** — The idea is the same?

**M. Feyrabend** (in French). — Yes, the idea is absolutely the same; it is only the way of expressing it that is different.

**The President.** — Do you agree to adopt Summaries 11, 12, 13, 14 and 15?

**M. Quéron** (in French). — Going back to Summary 8, I think we might begin the first paragraph as follows : « *It appears useful to* recall Summary 5, *(a)* of Question 1, Section 1 of the... » the remainder being unchanged.

**The President.** — Are we in agreement with this alteration. *(Approved.)*

**M. Renda** (in French). — I want to suggest adding a word to the text of Summary 15, paragraph 2, where it is stated :

« Present progress in the technique of the composition of the track (elimination of joints) and the technique of the material used (increase in the life of sleepers) will allow, if present... ». I would like to say :

...and in the technique of the material used *(especially* the increase in the life of sleepers)... » because this refers to all the permanent way material, not only to sleepers.

— This suggestion was approved.

**The President.** — It remains to give a continuous numbering to the Summaries of Question I, now duly approved, in particular to replace the numbers 4 (ii), 4 (iii) and 4 (iv) respectively by 5, 6 and 7 and I suggest we trust our Secretaries to see that is done right. *(Agreed.)*

— *The complete text of the Summaries is given hereafter.*

— *The Section then started the examination of Question 2.*

# DISCUSSION AT THE PLENARY MEETING.

## Meeting held on the 25th May 1954.

SIR BRIAN ROBERTSON, PRESIDENT, IN THE CHAIR.
GENERAL SECRETARIES : P. GHILAIN AND CH. E. WHITWORTH.

**The President.** — Gentlemen, our agenda to-day includes an examination of the Summaries already adopted in the different Sections.

Will the General Secretary be good enough to submit to the Meeting the Summaries of Question I (Section I).

**Mr. Ghilain,** *General Secretary* (in French). — The text of the Summaries for Question I was published in the *Daily Journal of the Congress,* No. 4.

*(No objections were raised during the examination of these Summaries.)*

**The President.** — We may therefore consider the Summaries for Question I as adopted.

### SUMMARIES

« 1. The maintenance work of the « length gangs varies in different Railway « systems according to circumstances « such as climate, density of population, « wages, social and economic conditions, « cost of materials, living standards, etc.

« 2. Up to the last year or two, length « gangs were generally organised in small « gangs (less than six men) responsible for « all maintenance work on the length in « question (inspections, maintenance « work proper, as for instance levelling, « lining, gauging, weedkilling, etc.) and « various other works of local character, « such as relief of permanent level crossing « keepers.

« The burden arising from these tasks, « as well as lodging difficulties and trans- « port of personnel, make it difficult for « the Administrations to realise a reduc- « tion in the manpower employed in day- « to-day track maintenance.

« 3. Railway Administrations endea- « vour to reduce to a minimum track « maintenance costs with due consider- « ation to the necessity of carrying a « constantly increasing weight and speed « of traffic in comfort and security.

« 4. Especially in countries where in- « creasing wages have made it necessary « to get the very most out of the man- « power, trials have successfully been « undertaken in which the following two « fundamental tendencies appear :

« *a)* the search for an improvement in « overall productivity by the concentra- « tion of personnel in longer gang lengths « with a strength of at least 8 men, or « by the use of mobile gangs in conjunc- « tion with reduced local gangs.

« *(b)* the search for an improvement « in individual productivity by the use of « motorised tools which allow of the « same individual carrying out more « easily some more important works.

« 5. The solutions agreed should allow « of :

« *(a)* the reduction in the overall num- « ber of gangers and a better organisation « of the work;

« *(b)* a greater continuity and more « clearly defined tasks allotted to each « ganger;

« *(c)* the production of more uniform « and probably more durable work;

« *(d)* the carrying out of relatively « important track work may fall within « the scope of private enterprise.

« 6. The economic and density of po- « pulation factors have an important « influence on the predominance accorded « to one or the other of the tendencies in « the solutions applied : each of them « having, moreover, its limits of applic- « ation. The same factors can tend to « increase or reduce that part of the work « let to contract.

« 7. Concentration allows the manage- « ment to follow more closely the work « carried out by the gang. On the other « hand, the social advantages of personnel « returning each evening to their homes « should not be overlooked. This is a « question to which the men, in general, « attach great importance.

« Mechanisation is already largely « applied to major renewals in connection « with which the question no longer arises. « For the smaller works of day to day « maintenance its application should be « more carefully considered. It necessit- « ates a very precise appreciation of the « works to be done in order to avoid « unnecessary operations.

« To get the best result from the use « of mechanical tools supervisors and « operators must be well trained in their « use and daily maintenance.

« 8. The determination of the mainten- « ance works to be done has for many « years generally been based on :

« *(a)* the experience of the durability « of the work under the local conditions « involved (predetermined cycles). This « depends partially on an estimate and « can vary much from place to place;

« *(b)* the very careful examination in « the field of the track (systematic sur- « veys). These surveys are complicated « and take much time;

« *(c)* the appearance of trouble in the « track.

« 9. *(a)* After recognising the insuffi- « ciency of the « stitch in time » method « for assuring the proper condition of « permanent way because when work is « put in hand the faults may well have « reached a stage where they are irrepar- « able, some systems have adopted a « general method of overhaul applicable « to the whole of the system which is too « onerous.

« *(b)* The introduction of methodical « maintenance covering a periodic « general overhaul and a limited overhaul « to deal with level, especially at the « joints, and tightening up the fastenings, « has resulted in savings, especially from « the labour point of view.

« *(c)* The necessity for maintenance « operations is no longer based on a « simple estimate of the actual condition « of the track, but chiefly on an estimate « of the probable rate at which it will « wear.

« There will be important savings due « to the reduced mileage to be dealt with, « a better definition of the elementary « work, and a reduction in the number « of immediate overhauls.

« 10. Recording vehicles, particularly « those which give the position of each « rail in the vertical and horizontal planes « and the gauge, give invaluable services « from this point of view, with regard to « the factors to which they are sensitive. « By the comparison of successive record- « ings they make it possible to follow the « evolution of the condition of a given « line.

« The use of recording vehicles is of « very great economical value, because it « permits the maintenance work to be « done exactly on the right spot and just « at the right moment, with consideration « to the track standard of the entire rail- « way system.

« 11. It should be recalled that this « question has already been considered « in Summary No. 5 *(a)*, of Question 1, « of the Enlarged Permanent Commission « which met at Lisbon on June 4, 1949, « in the following form :

« The maximum output of mechanis- « ed equipment for cleaning and « screening the ballast, and the removal « and replacement of the track, is « obtained when it is possible to take « advantage in long gaps in the running « of trains. This practice allows of a « speeding up of relaying operations, « of a reduction in the delay in carrying « them out in one section of track, in « short, to reduce the expense of all « services and particularly the expense « of slowing up traffic.

« It is particularly important that the « planning of permanent way renewals « should be made in full agreement with « the Operating Department.

« 12. The final summaries adopted at « the Enlarged Meeting of the Permanent « Commission (Lisbon, June, 1949) men- « tion the paths for the movement of the « men and machines as follows :

« It is desirable in future in the case « of new railway construction or when « modifying existing lines to provide « large cesses to facilitate the use of « mechanical equipment and generating « plant.

« Besides this, the existence of such « paths is also very desirable for the « safety of the men, because in a large « measure they reduce the movement « of men to and from their place of « work on the track.

« It is equally desirable to maintain the « continuity of the « side paths » when « electrification is being carried out.

« 13. The factors in the evolution of « maintenance : concentration of gangs, « organisation of works and mechanis- « ation, are capable of yielding consider- « able economies as compared with « present methods. Nevertheless -

« the economic advantages of con- « centration decrease when high cost « is involved in the transport or lodging « of a gang when the area is greater

« than can be covered by the men on « foot;

« the potential economies of mechan- « isation fall when the volume of work « is small, or when traffic is consider- « able.

« 14. The general application of the « new methods will only be crowned with « success when the administrative staff « fully understand the possibilities and « limitations of these methods and how « to take full advantage of the economies « which it is hoped will result from their « application.

« 15. The replies received from the « various Administrations cover all the « methods applied to standard track « maintenance.

« Present progress in the technique of « the composition of the track (elimin- « ation of joints), and with regard to the « material used (notably an increase in « the life of sleepers) will allow, if present « hopes are realised, of effecting a con- « siderable reduction in recurring items « of maintenance. The labour strength « necessary for maintenance work proper « will certainly be reduced and new com- « position of length gangs will need to « be studied.

« The question of extraneous duties « (inspection and obligations in connec- « tion with level crossings in particular) « should form the subject of thorough « investigation because it will become « increasingly impossible to burden length « gangs with such work if their output « is not to be affected. »

## QUESTION 2.

## A) Modernisation of station buildings and methods employed in financing modernisation projects.

## B) Standardisation of unit construction applied to railway building.

### Preliminary documents.

Report (America (North and South), Australia (Commonwealth of), Burma, Ceylon, Denmark, Egypt, Finland, India, Indonesia, Irak, Iran, Republic of Ireland, New Zealand, Norway, Pakistan, South Africa, Sweden and the United Kingdom of Great Britain and Northern Ireland and the territories for whose international relations the United Kingdom is responsible), by Dr. F.F.C. CURTIS. (See *Bulletin* for November 1953, p. 831, or separate issue No. 9.)

Report (Austria, Belgium and Colony, Bulgaria, Czechoslovakia, France and French Union, Germany, Greece, Hungary, Italy, Luxemburg, Netherlands, Portugal and Colonies, Rumania, Spain, Switzerland, Syria, Turkey and Yugoslavia), by José CHEDAS BOGARIM. (See *Bulletin* for December 1953, p. 935, or separate issue No. 13.)

*Special Reporter :* Dr. F.F.C. CURTIS. (See *Bulletin* for May 1954, p. 511.)

## DISCUSSION BY THE SECTION.

## Meeting held on the 24th May 1954.

PRESIDENT : J.C.L. TRAIN, C.B.E., M.C.

**The President.** — Now, we will examine Question 2, which is dealt with in two parts. We will proceed at first with the Summaries of *Part « A » : « Modernisation of station buildings and methods employed in financing modernisation projects. »*

Mr. DUBUS, *Principal Secretary*, will read the French Summaries and Mr. GLENDINNING, *Secretary*, will read them in English.

PART « A » :

**Modernisation of station buildings and methods employed in financing modernisation projects.**

**Mr. Dubus.** — *Summary No. 1 :*

1. A number of Administrations operating important railway systems base their modernisation projects on statistics of the anticipated volume of traffic and revenue therefrom. Others, mainly smaller ones, regard the traffic requirements alone as sufficient justification.

**The President.** — Any comments on Summary 1?

**M. Caliendo,** *Italian State Railways* (in French). — Mr. President, Gentlemen, I would like to make a few general remarks about the question we are going to discuss.

In the questionnaire upon which the reports were based, two different questions were set :

1) Are schemes for the modernisation of the station buildings accompanied by a study of the traffic and the increase in net revenue anticipated from such projects?

2) Does the capital expenditure depend on the net revenue from the traffic of the stations concerned?

It should however be remembered that the first question implies a third question, namely :

— is the carrying out of the modernisation projects subordinated to a positive finding from the financial studies which have accompanied the projets in question?

A certain number of Administrations replied in the affirmative to the first question, whereas the replies to the second question were on the whole in the negative. But the same Administrations, who gave an affirmative reply to the first question, made it understood that the net revenue anticipated as a result of the financial studies which accompanied the project was not the only nor most often the most important of the conditions taken into consideration in deciding whether it was to be carried out or not.

These different stands taken by the various Administrations seem to me to be very clearly shown in the summaries suggested in this connection in the special report. In fact, the three questions which we have quoted above have been amalgamated in the first of these summaries, which is so worded that it seems to be inspired above all by the replies received to the first of these questions rather than those received for the other two.

That a certain number of Administrations *accompany* their modernisation projects by an estimate of the net revenue anticipated from carrying it out, does not amount to saying that they *base* the decision taken upon these estimates. It would therefore appear desirable to modify the wording of the summary suggested for summary 1 so as to bring out the two different ideas mentioned above.

In this same summary 1, it is stated that the Administrations who base their modernisation projects upon statistics of the expected traffic and the resulting receipts, consider *traffic requirements alone* as sufficient justification.

The phrase « traffic requirements » is also rather vague. Moreover, setting the condition relating to « traffic requirements » against the receipts that can be

expected from the new investment, involves a risk of misunderstanding, by which I mean that our summaries on this point might be interpreted as meaning that the economic value of the work of bringing station buildings up to date is in many cases neglected or sacrificed to other requirements.

If this was really so, we would have to make quite clear what these non-economic exigencies were, and endeavour to justify and demonstrate their priority over economic considerations. But this is not the case. Reading the reports and considering the conditions most frequently mentioned amongst those justifying the modernisation of station buildings, it is possible to draw the following conclusions :

1) There are many cases in which the modernisation of a station building can be said to be based upon economic considerations, although it will not leap to an increase in the receipts. This is the case with modernisation schemes intended to give savings in maintenance costs or other operating costs, owing to a more rational arrangement of the station services. Obviously, such savings are in fact an increase in the receipts, as they lead to a net increase in the revenue of the undertaking.

This is also the case when a station building is modernised when it is being altered or reconstructed owing to modification to the fixed installations of the station in question, the cost of which will have been calculated in the total sum allowed for this modification and included in the estimates of the profitability of the investment concerned.

2) There are other cases in which, on the contrary, the improvement or modernisation of the station buildings are made quite apart from any calculation of the profitability thereof, the sole consideration being to assure the maintenance and continuity of operating or to meet an increase demand for transport in so far as this must be met.

This is the case with improvements made on the occasion of certain consolidation or partial or total reconstructional work, made necessary by the age of the buildings, such work not being considered as an increase in the capital invested which must be assured of an increased net revenue, but simply as renewal work necessary to assure — as we have already said — the maintenance and continuity of the operating. This is also the case with work which has become necessary owing to or in view of a lasting increase in the traffic, which though not a profitable traffic must nevertheless be satisfactorily dealt with.

In the above cases, the necessity for the work in question has to be looked for in the obligation to operate or carry, which is generally imposed by the public authorities on railway undertakings, which has to be respected quite apart from the profitability of the investment of capital needed to assure it.

**Dr. Curtis,** *Special Reporter.* — Summary 7 refers to that.

**M. Dubus,** *Principal Secretary* (in French). — Do you wish summary 1 to be modified? Dr. Curtis, the Special Reporter, who drew up this summary tells me — as I thought — that your

remark concerning the replacement or reconstruction of old buildings belongs rather to summary 7 where this matter is dealt with.

**The President.** — I suggest to the Meeting that it would be better, perhaps if we continue with the other questions, and then we will ask Dr. CURTIS with the Italian delegates, with the help of M. DUBUS, to redraft this summary when we have done some of the others. If that is agreeable.

**M. Dubus.** — Yes, all right.

**The President.** — Any other comments?

**Mr. Sood,** *Indian Government Railways.* — I have to suggest a very minor modification to the second sentence of Summary 1. « Others, mainly smaller ones, regard the traffic requirements alone as sufficient justification. » I would rather this should read : « Others regard the traffic requirements alone as sufficient justification. » Because this is the practice on the Indian Railways and I do not think they could be said to be small railways.

**The President.** — The wording will be altered to suit Mr. SOOD'S point. That will be attended to. Now, may we continue to Summary No. 2.

**M. Dubus.** — *Summary 2 :*

2. In minor works, replacement, maintenance and repairs are generally charged to revenue, improvements to capital account.

**Mr. Ratter,** *British Railways.* — I was wondering whether the words « minor works » so far as British Railways are concerned, give a wrong impression, because we take the course, wherever existing buildings are to be modified, not only for minor works on British Railways. I think this would read better as : — « When existing buildings are being modernised, replacements, maintenance, etc., etc., »

**The President.** — Is that agreed?

**M. Quéron,** *French National Railways* (in French). — How is summary 2 going to read?

**M. Dubus.** — It will read like this : « *When buildings are modernised,* replacements, maintenance and repairs are generally booked to the operating account, and improvements to the capital account. »

**M. Bouciqué,** *Belgian National Railways* (in French). — We might say : « *During modernisation work,* replacements, maintenance, etc... ».

**The President.** — That would meet Mr. RATTER'S point.

**Mr. Venkataramayya,** *Indian Government Railways.* — When buildings are being modernised the cost of maintenance does not arise. The cost of replacement is charged, but not the cost of maintenance when the building is not built yet?

**The President.** — I will ask Dr. CURTIS if he will say something in reply.

**Dr. Curtis.** — It must be considered that in some cases there is rebuilding and maintenance going on side by side, at the same place. Not always is a whole station re-built, but part rebuilding and part maintenance, and the two together form the project of work.

**Mr. Ratter.** — I think the point could be met if the word « maintenance » were left out. It would simply say, « renewals and repairs. » I think that would meet our Indian delegate's point.

**The President.** — Would that meet Mr. VENKATARAMAYYA'S point?

**Mr. Venkataramayya.** — If the word « maintenance » was left out.

**The President.** — Is that agreed?

**M. Bouciqué** (in French). — Mr. President, three accounts are concerned in some Administrations whenever any work is undertaken, whether reconstruction, or modernisation of buildings. For example, when there is no increase in the value, the capital is not increased and such work, even in the case of improvements, is entered in the maintenance account or renewals account. Only that work which adds to the value of the buildings is booked to the capital account.

Could we not say :

« *In modernisation work*, replacements, maintenance and repairs are generally booked to the operating or *renewals* account; improvements which result in *increased values are booked* to the capital account. »

**The President.** — Yes, that is what Dr. CURTIS calls « betterment ».

**M. Bouciqué** (in French). — It is quite possible to improve a building, alter its interior arrangements, or modernise it, without adding to its value. This is either renewal or maintenance, but you are not increasing your capital.

**Dr. Curtis.** — The word « improvements » was used in the summary, but it means « betterment ».

**M. Dubus.** — May I suggest to adjourn the meeting for a few minutes in order to compare the suggestions made by some delegates and draft a new wording.

**The President.** — That is a very good suggestion M. DUBUS.

Gentlemen, the meeting will adjourn until 10.45 a.m. to permit the revision of the text in question by a small sub-committee.

*— The meeting adjourned at 10.20 and recommenced at 10.45.*

**The President.** — Gentlemen, we have made a start with the revision of summaries 1 and 2.

M. BOUCIQUÉ agrees that a text should be drawn up on the lines suggested by M. CALIENDO. To prepare this new text — the first part of which will include the text suggested by M. BOUCIQUÉ and the second, that of M. CALIENDO — a Drafting Committee will meet after this session, so that we can put the revised text before you at the beginning of tomorrow's meeting. Moreover, it is evident that in

this connection, we must be content to leave the wording rather vague, as each country and each administration has its own way of proceeding.

We will now examine the following Summaries, and leave aside for the moment Summaries 1 and 2. *(Agreed.)*

**M. Dubus.** — *Summary 3 :*

3. Very large projects are always carried out in stages, each financed separately. Wherever possible, expenditure is met from revenue, working capital or renewal and depreciation reserves, though some Administrations employ loan capital.

**Mr. Maunder,** *Ministry of Transport and Civil Aviation, Great Britain.* — One small amendment I would like to suggest in Summary 3. That is instead of « always » we should put « usually ».

**M. Peirani,** *French National Railways* (in French). — We might even say « often ».

**The President.** — Is that agreed : « Very large projects are often carried out... »

— *(Adopted.)*

The text of *Summary 3* will be :

« 3. Very large projects are often carried out in stages, each financed separately. Wherever possible, expenditure is met from revenue, working capital or renewal and depreciation reserves; when possible some Administrations employ loan capital. »

**M. Dubus.** — *Summary 4 :*

4. The annual maintenance and renewal liabilities are in some cases calculated on a uniform basis for all types of construction, but some Administrations differentiate between buildings with a long expectation of life and those of a more temporary construction.

**The President.** — Any remarks?

— *Agreed without discussion.*

**M. Dubus.** — *Summary 5 :*

5. Most Administrations take into account the earnings from ancillary service, but, except at large stations, the amounts involved are not of great importance. Nevertheless, there is much to be said for exploiting to the fullest extent the possibilities of earning from shops, restaurants, hotels, advertising display, etc. A considerable portion of the money needed for station reconstruction can, in favourable circumstances, come out of revenue from ancillary services, or from capital contributions made by tenants.

**The President.** — Do we agree on this text?

**M. Lohmann,** *Netherlands Railways.* — As the cost of building new hotels, restaurants, etc., must take account of the earnings of ancillary services, and the earnings of these ancillary services generally are not sufficient to cover rent, is it not advisable to limit the buildings which we put up at our stations, and provide those buildings which are strictly necessary? A railway ought to restrict its buildings to the convenience of travellers, and not to float hotels, etc. so stations should be kept as waiting rooms, and refreshment rooms on the platforms only.

**The President.** — But that would never be agreed, because so many countries do not restrict their buildings as you say. This is a conclusion representing

views of many countries. That is why we say « most » and not « all ». But we will try and alter this to meet your point. We could use the words « Some Administrations ». Of course, it is understood that what is said will be recorded in the Daily Journal.

**M. Peirani** (in French). — In this same summary it says : « In favourable circumstances, a considerable portion of the money needed... », I think this should be made less definite, and instead of saying *considerable* we should say « a fair proportion... » for example.

**M. Caliendo** (in French). — True.

**M. Venkataramayya.** — I suggest this last sentenee be deleted altogether as the point is covered in the first part.

**M. Peirani** (in French). — In my opinion, it should be retained.

**The President.** — The Indian delegate considers it is covered in the first part. Is there some alteration of words which would meet Mr. VENKATARAMAYYA'S point of view? It is not the desire of the other delegates to delete the sentence altogether, but we can alter it to meet his remark.

**M. Venkataramayya.** — It is stated here, « ...Nevertheless, there is much to be said for exploiting to the fullest extent the possibilities of earnings from shops, restaurants, and so on... » So it is clear there that there is an opportunity to exploit earnings whether some portion of the money is included or not. But if there is a preference to keep it as it is, then I agree.

**The President.** — Our Indian colleague has been kind enough to leave it if the majority of the delegates wish to have it in.

**M. Peirani.** — To meet the wish expressed by our colleague from India, we might alter the meaning of the sentence by saying : « In *certain cases* a fair proportion... » or « *In certain cases, a portion of the money needed...* »

**M. Dubus.** — « In *a few cases...* »

**M. Peirani** (in French). — « ...a portion of the money... »

**The President.** — The text will then be amended as follows :

« 5. Some Administrations take into account the earning from ancillary services, but, except at large stations, the amounts involved are not of great importance. Nevertheless, there is much to be said for exploiting to the fullest extent the possibilities of earnings from shops, restaurants, hotels, advertising display, etc. In some cases a portion of the money needed for station reconstruction can come out of revenue from ancillary services, or from capital contributions made by tenants. »

— *This amended text was adopted.*

**M. Dubus.** — *Summary 6 :*

6. Contributions towards station reconstruction projects from local authorities are limited in extent, except where work is carried out directly for their benefit. Only rarely has local pride, allied to commercial instinct, seized the opportunities offered in making a railway station a civic building.

**Mr. Swartling,** *Swedish State Railways.* — I suggest that the utilisation of station buildings as commercial centres and as connecting points with local bus lines ought to be studied in collaboration with other interested parties. In big cities this also applies to the utilisation of the station buildings as city terminals for the air ports and — when the technical needs of economically working helicopters is better defined than today — possibly also the use of stations as landing-sites for helicopters.

**The President.** — May I suggest to Mr. SWARTLING to go along with the other gentlemen who are going to re-draft Summaries 1 and 2, he might help to re-draft this item to include his very good point about air ports and helicopters. That is a thing which we will probably have to look to in the future.

**Mr. Swartling.** — Yes, we will have to give it more attention.

**M. Dubus.** — Mr. SWARTLING will join the small Committee which will meet at the end of the meeting. This Committee can also prepare the paragraph which Mr. SWARTLING wants to have added at the end of Summary 6.

**M. Caliendo** (in French). — Mr. PRESIDENT, I wish to draw the attention to the fact that the expression *local authorities*, at the beginning of summary 6, does not exactly express what we want to say. We are thinking of the *public* authorities, not the *local* authorities. I think it would be better to say : « The contribution of the *public authorities...* ».

**M. Quéron** (in French). — Perhaps we could say : the *local community* as there may be chambers of commerce or other such bodies which are not public authorities but local authorities. I suggest we say : « The contributions of the local *community...* »

**M. Dubus.** — The text will be considered by the Committee. *(Approved.)*

**M. Dubus.** — *Summary 7 :*

7. In the planning stages of reconstruction schemes the general practice is to try to make economies by taking advantage of the most up-to-date equipment and methods of working. It is most important that the designers and the using departments work in the closest co-operation in order to obtain the fullest benefits from saving in personnel and improved working.

**The President.** — Do you all agree to this text?

*— Summary 7 was adopted without alteration.*

**The President.** — Now, we will go on to *Part B.*

## PART « B »

## Standardisation of unit construction applied to railway building.

**M. Dubus.** — *Summary No. 1 :*

1. For railway purposes, standardised unit construction appears to be the answer to a need for temporary structures which can be quickly built, quickly removed and easily enlarged or adapted. Its use has, on the whole, been limited to buildings of an industrial character, such as locomotive sheds, goods depots and to various types of small buildings such as lengthmen's huts, shelters and small stores.

**The President.** — Any remarks?

**M. Ratter.** — I would like to suggest the word « temporary » be made « simple », because I do not think it is right to say it applies to temporary buildings only, many of them will be there for 20 years or more.

**M. Dubus.** — Therefore, we will put « ...*simple* structures » instead of « temporary structures ».

**Mr. Ratter.** — I would also like to suggest we bring in economy somewhere. Such as « a need for simple structures which can be quickly and economically built, etc., »

**M. Peirani** (in French). — The words « quickly demolished » can be replaced by « easily taken down. » This is closer to the Special Reporter's English text.

**M. Dubus.** — In agreement with Mr. GLENDINNING, in English the words « easily dismantled » will be used. The new text will be : « ... simple structures which can be quickly and economically built, easily dismantled... »

**M. Peirani** (in French). — I would also like to see included in this summary another idea than that of completely standardised buildings. There is also considerable value in « unifying » if not in standardising completely such building components as doors, windows, partitions and other parts which can then be used in all buildings.

**M. Dubus.** — I think this is included somewhere in the report.

**Dr. Curtis.** — Yes.

**M. Peirani** (in French). — But it should be stressed.

**M. Dubus.** — This point is included in Summary 3.

**M. Peirani.** — In that summary, it is a question of fittings and accessories, whereas I am speaking about the actual building components.

**M. Bouciqué** (in French). — I do not think it is a question of the fittings.

**M. Dubus.** — I will read you Summary 3, which seems to meet M. PEIRANI's remark.

*Summary 3 :*

3. It appears to be the general view that, at least as far as initial cost and rapidity of construction are concerned, standardised unit construction systems have advantages, but the greatest advantage from standardisation in buildings has been gained from the use of standard components especially those in general use in the building trade, standard fittings and equipment.

**M. Peirani** (in French). — We should say *type* and not *standard.*

There is a considerable difference between the two.

**M. Dubus.** — I think we should say « *type* » in French and *standard* in English — that will be exactly the same.

Your point of view is met as regards the use of standard components. If you agree, I will read you Summary 2.

*Summary 2 :*

2. For station buildings generally and for non-industrial buildings the character of the countryside, climatic conditions and local customs are taken into account. Such buildings must not become discordant factors in their surroundings and nearly always need to be specially designed.

**M. Quéron** (in French). — I think that Summary 3 might come before Summary 2, as it is a continuation of Summary 1.

**The President.** — That would seem reasonable, what do you think Dr. CURTIS?

**Dr. Curtis.** — Yes, I do not mind, perhaps it would be better that way.

*— The Meeting agree. Consequently, Summary 3 becomes Summary 2 and both Summaries were adopted. The definite text will be given during the next session.*

**M. Dubus.** — *Summary 4 :*

4. It is unlikely that technical developments in the building industry will outstrip the progress of prefabrication systems.

**The President.** — Do we agree?

*— Adopted without modification.*

**M. Dubus.** — *Summary 5 :*

5. The application of standardised unit construction does not need to destroy initiative among technical staffs since standards must be constantly under review.

**Mr. Swartling.** — I think I will suggest that the words in the last line « constantly under review », should be changed a little to say, « every 3 or 5 years, » because if it is constantly under review there will not be any standardisation at all.

**The President.** — I suggest it would meet the Swedish delegate's point of view if the words were altered to read « at regular intervals. » Would that meet your point? Or « must be kept under review », deleting the word « constantly »?

**M. Dubus.** — We might simply say : « ...should be subject to revision. » without adding anything further.

**M. Peirani** (in French). — I suggest « to revisions ».

**Mr. Ratter.** — I would like to suggest that we add a last sentence to this summary. One of the advantages of standardisation is that it does save the time of the technical staff. That is nor brought out in the summary.

**The President.** — This is an addition which is being suggested for No. 5. If you got the wording, I think what our colleague said was that it is also important in order to save time of technical staff to have standardisation; or standardisation is also important in order to save the time of technical staff.

**Mr. Ratter.** — To economise in the time of technical staff.

**The President.** — We might say : « Standardisation is also important in order to economise in the time of technical staff. »

**Mr. Ratter.** — Or « Design staff » might be better.

**The President.** — This addition has therefore the following meaning : « Stan-

dardisation is also important in order to economise in the time of design staff. » The modified text of Summary 5, duly re-drafted, will be submitted to you during the meeting of May 25.

**M. Julien,** *Ministère des Travaux Publics, des Transports et du Tourisme, France* (in French). — I am returning to Summary 4. What does this mean? I do not understand it at all. In fact, I read :

« It is unlikely that technical developments in the building industry will outstrip the progress of prefabrication systems »

and vice versa. I do not see what this leads up to. What does it mean?

**M. Dubus.** — We will ask the Special Reporter Dr. CURTIS to be good enough to give the requested explanations.

**Dr. Curtis.** — It is explained in the Special Report under Question 7, « Has it been found that technical developments in the building industry tend to render any system of standardised unit construction out of date, or was it possible to make adjustments without difficulty. » (See *Bulletin* for May 1954, p. 516.)

**M. Dubus.** — It needs some time to appraise an improvement.

**M. Julien** (in French). — Methods of prefabrication are relatively recent; to start with they made extremely rapid progress, but are they likely to continue to do so? We do not know:

**M. Dubus.** — That is why the wording of the summary has been left in very general terms. « it is unlikely... »

**M. Peirani** (in French). — We could always invert the sentence and say that it is probable that traditional types of buildings and methods of prefabrication will develop hand in hand or parallel to each other.

— *The definite text of Summary 5 will be submitted during the next meeting.*

**Mr. Venkataramayya.** — On the Indian Railways, we have standardised most of the passenger platforms' shelters. The construction of platform shelters is standardised to a large extent, and they are put up in large numbers, and I suggest that a small alteration be made in Summary No. 1, Part B. to include this.

**The President.** — If you will briefly make the point of what you want included.

**Mr. Venkataramayya.** — Yes, if just this about platform shelters could be mentioned in Summary No. 1.

**The President.** — Small buildings are already mentioned. These are intended to cover shelters, but the sub-committee will look into this when they are re-drafting this summary. Gentlemen, now we have agreed Summary 5, so that disposes of all questions, or rather summaries.

So the sub-committee will now meet instead of at 11.45, and the Swedish delegate, will he please go along.

Thank you Gentlemen. At 9 o'clock tomorrow morning then we resume.

— The meeting *adjourned at 11.30 a.m.*

# Meeting held on the 25th May 1954.

PRESIDENT : J.C.L. TRAIN, C.B.E., M.C.

— The meeting started at 9 a.m.

**The President.** — Gentlemen, now we will read out the texts submitted by the Drafting Committee, which drew up new wordings for Summaries 1 and 2 of *PART « A »*, to satisfy in particular Mr. CALIENDO.

This text was approved by all the members of the Committee, constituted by Dr. CURTIS, *Special Reporter*, Messrs CALIENDO, PEIRANI and SWARTLING. I would like to mention that Mr. BOUCIQUÉ has kindly drawn up part of this text. I hope that you will approve these Summaries.

Then, we will read once more the other summaries, as some have been slightly amended or corrected to meet remarks made during the discussion.

*PART « A »*

*Modernisation of station buildings and methods employed in financing modernisation projects.*

*Summary No. 1 :*

« 1. A number of Administrations operating important railway systems take into account in their modernisation projects statistics of the anticipated volume of traffic and revenue therefrom. Other Administrations consider that certain factors should not be overlooked, such as :

« the necessity to cater for the requirements of present day traffic;

« the necessity to cater for the requirements of estimated future traffic;

« the possibility of realising economies in maintenance and operating costs by means of improved planning of station amenities;

« the necessity of making alterations to buildings following alterations in the general layout of the station. »

**M. Dubus.** — This I think completely meets the wish expressed by M. CALIENDO. Do you agree to this wording?

**M. Peirani** (in French). — We agree Mr. President, but a few of us think that two words might be altered at the beginning of the second sentence of the first paragraph (French text).

Instead of « D'autres cependant estiment qu'il ne faut pas négliger certains facteurs, tels que... », which gives an idea of opposition compared with « Différentes Administrations... tiennent compte.. etc. » We suggest saying : « Cependant d'autres facteurs peuvent l'emporter, tels que... »

**M. Dubus.** — The idea is the same, it is merely a question of the wording.

— *Adopted, with the alteration to the French text requested* by M. PEIRANI. The English text remains as it stands.

*Summary 2 :*

« 2. In modernisation works, renewals, maintenance and repairs, are in general charged to revenue. »

— *Adopted without remarks.*

*Summary 3 :*

« 3. Very large projects are often carried out in stages, each financed separately. Wherever possible, expenditure is met from revenue, working capital or renewal and depreciation reserves; when possible some Administrations employ loan capital. »

**M. Julien** (in French). — In the case of the French Railways, it is the State which meets part of the permanent way expenditure. This is not mentioned in the statement.

**The President.** — Is not that met in the English « Wherever possible... »? In English that means that there may be some exceptions to the rule.

**M. Quéron** (in French). — Perhaps we could say : « *Quand il est possible*, les dépenses sont couvertes... »

— *Adopted with this slight modification to the French text.*

*Summary 4 :*

« 4. The annual maintenance and renewal liabilities are in some cases calculated on a uniform basis for all types of construction, but some Administrations differentiate between buildings with a long expectation of life and those of a more temporary construction. »

— *Adopted.*

*Summary 5 :*

« 5. Some Administrations take into account the earnings from ancillary services, but, except at large stations, the amounts involved are not of great importance. Nevertheless, there is much to be said for exploiting to the fullest extent the possibilities of earnings from shops, restaurants, hotels, advertising display, etc. In some cases a portion of the money needed for station reconstruction can come out of revenue from ancillary services, or from capital contributions made by tenants. »

— *Adopted.*

*Summary 6 :*

**M. Dubus.** — As regards Summary 6, M. Quéron also pointed out to us that certain bodies such as the chambers of commerce should be taken into account. This has been borne in mind in the new wording, as well as M. Swartling's suggestion who wished to see stations used as commercial centres and railroad and rail-air links. This text also takes M. Caliendo's remarks into account.

« 6. The contributions from public authorities and local bodies to station reconstruction schemes are of limited extent, except when the work is carried out directly for their benefit. Only rarely has local pride, allied to commercial instinct, seized the opportunities offered in making a railway station a civic building. »

« The use of station buildings as commercial centres and as connecting points with local bus lines should be studied

in collaboration with other interested parties. In big cities this also applies to the utilisation of station buildings as terminals for airports, and, possibly, also the use of stations as landing sites for helicopters when the technical requirements are better understood. »

**The President.** — We are indebted to Mr. SWARTLING for suggesting that important point about helicopters, which shows we are modern in outlook.

**M. Quéron** (in French). — I would like to say, if possible : « The contributions from the authorities, etc... towards reconstruction *or transformation* projects for stations... » as it seems to me that the text covers reconstruction schemes and also those in which the station is altered without being reconstructed throughout.

**M. Renda,** *Italian State Railways* (in French). — Mr. PRESIDENT, I should like to suggest another modification.

In the second paragraph of Summary 6, it says :

« The use of station buildings... etc. *should be* studied in collaboration etc... » Could this not be made less imperative by saying « The use of station buildings... etc... *might be* studied... » I would like a less imperative text.

**M. Dubus.** — Do you agree to this suggestion?

**M. Quéron** (in French). — I propose to say « ...it is desirable... »

**M. Dubus.** — I prefer : « ...it is desirable... » « *Might* be » rather seems to be running with the hare and the hounds.

Consequently we will say : « *It is desirable* that the use of station buildings as commercial centres and as connecting points with local bus lines *should be* studied in collaboration... etc. »

— *Adopted with the following wording, which takes into account the various suggestions made :*

« 6. The contributions from public autorities and local bodies to station reconstruction or alteration schemes are of limited extent, except when the work is carried out directly for their benefit. Only rarely has local pride, allied to commercial instinct, seized the opportunities offered in making a railway station a civic building.

« It is desirable that the use of station buildings as commercial centres and as connecting points with local bus lines should be studied in collaboration with other interested parties. In big cities this also applies to the utilisation of station buildings as terminals for airports, and, possibly, also the use of stations as landing sites for helicopters when the technical requirements are better understood. »

*Summary 7 :*

« 7. In the planning stages of reconstruction schemes the general practice is to try to make economies by taking advantage of the most up-to-date equipment and methods of working. It is most important that the designers and the using departments work in the closest co-operation in order to obtain the fullest benefits from saving in personnel and improved working. »

— *Adopted.*

**The President.** — Now we will examine *Part B.*

*PART «B»*

*Standardisation of unit construction applied to railway buildings.*

*Summary 1 :*

**M. Dubus.** — Summary 1 was the subject of well considered remarks by Messrs RATTER, PEIRANI and VENKATARAMAYYA. We have altered the text to take into account the points raised during the examination of this question.

Here is the new wording we wish to submit to you.

« 1. For railway purposes standardised unit construction appears to be the answer to a need for simple structures which can be quickly and economically built, easely dismantled and easily enlarged or adapted. Its use has, on the whole, been limited to buildings of an industrial character, such as locomotive sheds, goods depots, platform shelters, and to various types of small buildings such as lengthmen's huts, shelters, and small stores. »

I think this takes into account all the remarks made by the delegates during the meeting.

**The President.** — Is that agreed?

— *Adopted.*

*Summaries 2 and 3 :*

**The President.** — At the request of our friend M. PEIRANI, there is only one small alteration in the French text where the word *standard* has been replaced by *types*. The English text remains unaltered.

And of course, as requested by M. QUÉRON, Summary 3 has become No. 2 and Summary 2 has become No. 3.

**M. Dubus.** — *Summaries 2 and 3 :*

« 2. It appears to be the general view that, at least as far as initial cost and rapidity of construction are concerned, standardised unit construction systems have advantages, but the greatest advantage from standardisation in buildings has been gained from the use of standard components, especially those in general use in the building trade, standard fittings and equipment.

« 3. For station buildings generally and for non-industrial buildings the character of the countryside, climatic conditions and local customs are taken into account. Such buildings must not become discordant factors in their surroundings and nearly always need to be specially designed. »

— *Adopted without remarks.*

*Summary 4 :*

**M. Dubus.** — M. JULIEN remarked that this summary should be more clearly worded. After a discussion with Dr. CURTIS, *Special Reporter*, and M. PEIRANI, the following text was adopted to please M. JULIEN :

« 4. It is likely that technical developments in the building industry will keep step with the progress of prefabrication systems. »

**The President.** — No remarks?

— *Adopted.*

*Summary 5 :*

**M. Dubus.** — As regards Summary 5, M. SWARTLING made certain remarks; he was afraid that the words : « ...should be the subject of *constant* revision... » implied too much, the word *constant* being too imperative.

The PRESIDENT and Mr. RATTER, supported by M. PEIRANI suggested the following summary :

« 5. The application of standard unit construction does not need to destroy initiative among technical staffs since standards must be reviewed at due intervals.

« Standardisation is also important in that it effects economy in the time employed in the design of structures. »

**The President.** — Do you agree to this text?

*(Agreed)*

— *Summary 5 was adopted.*

**M. Peirani** (in French). — Excuse me, Mr. PRESIDENT, but I would like to go back to Summary 6 which deals with helicopters; it is merely a question of form.

In this summary of Part « A », it is stated : « In large towns, this also supposes the use of station buildings... etc. as landing grounds for helicopters. » I think we should say : « In large towns it is also possible to envisage the use... » because the word « should » is perhaps a little too strong.

**M. Dubus.** — I think that the English text can remain unchanged? *(Agreed).*

The French text was altered as requested.

— *Adopted.*

**The President.** — Well, Gentlemen, that finishes the business of Section 1, and I am most indebted to you for being so kind to the President. I would, however, before we finish, like to thank the Reporters and the Special Reporters, that is Mr. FEYRABEND, Dr. SCHRAMM and Mr. CLAUSSEN for Question 1, and for Question 2, M. BOGARIM and Dr. CURTIS, who is sitting beside me here. In this connection, we could not overlook our Principal Secretary, M. DUBUS, who has such great experience in these matters.

**M. Julien** (in French). — Mr. President, Gentlemen, I am sure I am interpreting the wishes of the Section as a whole in thanking our President Mr. TRAIN for the excellent way in which he has presided over our meetings *(Great applause).*

**The President.** — Gentlemen, this brings us to the end of the meeting.

# DISCUSSION AT THE PLENARY MEETING.

## Meeting held on the 26th May 1954.

SIR BRIAN ROBERTSON, PRESIDENT, IN THE CHAIR.

GENERAL SECRETARIES : P. GHILAIN AND CH. E. WHITWORTH.

**Mr. Ghilain,** *General Secretary* (in French). — We now come to Question 2, the Summaries for which were published in the *Congress Daily Journal* No. 5.

— *These Summaries raised no remarks.*

**The President.** — We will therefore consider the Summaries for Question 2 as adopted.

### SUMMARIES.

A. **Modernisation of station buildings and methods employed in financing modernisation projects.**

« 1. A number of Administrations operating important railway systems take into account in their modernisation projects statistics of the anticipated volume of traffic and revenue therefrom. Other Administrations consider that certain factors should not be overlooked, such as :

« the necessity to cater for the requirements of present day traffic;

« the necessity to cater for the requirements of estimated future traffic;

« the possibility of realising economies in maintenance and operating costs by means of improved planning of station amenities;

« the necessity of making alterations to buildings following alterations in the general layout of the station.

« 2. In modernisation works, renewals, maintenance and repairs, are in general charged to revenue.

« 3. Very large projects are often carried out in stages, each financed separately. Wherever possible, expenditure is met from revenue, working capital or renewal and depreciation reserves; when possible some Administrations employ loan capital.

« 4. The annual maintenance and renewal liabilities are in some cases calculated on a uniform basis for all types of construction, but some Administrations differentiate between buildings with a long expectation of life and those of a more temporary construction.

« 5. Some Administrations take into account the earnings from ancillary services, but, except at large stations, the amounts involved are not of great importance. Nevertheless, there is much to be said for exploiting to the

« fullest extent the possibilities of earn- « ings from shops, restaurants, hotels, « advertising display, etc. In some cases « a portion of the money needed for « station reconstruction can come out of « revenue from ancillary services, or from « capital contributions made by tenants.

« 6. The contributions from public « authorities and local bodies to station « reconstruction or alteration schemes « are of limited extent, except when the « work is carried out directly for their « benefit. Only rarely has local pride, « allied to commercial instinct, seized the « opportunities offered in making a rail- « way station a civic building.

« It is desirable that the use of station « buildings as commercial centres and as « connecting points with local bus lines « should be studied in collaboration with « other interested parties. In big cities « this also applies to the utilisation of « station buildings as terminals for air- « ports, and, possibly, also the use of « stations as landing sites for helicopters « when the technical requirements are « better understood.

« 7. In the planning stages of recon- « struction schemes the general practice « is to try to make economies by taking « advantage of the most up-to-date equip- « ment and methods of working. It is « most important that the designers and « the using departments work in the « closest co-operation in order to obtain « the fullest benefits from saving in « personnel and improved working. »

### B. Standardisation of unit construction applied to railway buildings.

« 1. For railway purposes standardised « unit construction appears to be the « answer to a need for simple structures « which can be quickly and economically « built, easely dismantled, and easily « enlarged or adapted. Its use has, on « the whole, been limited to buildings of « an industrial character, such as loco- « motive sheds, goods depots, platform « shelters, and to various types of small « buildings such as lengthmen's huts, « shelters, and small stores.

« 2. It appears to be the general view « that, at least as far as initial cost and « rapidity of construction are concerned, « standardised unit construction systems « have advantages, but the greatest « advantage from standardisation in buil- « dings has been gained from the use of « standard components, especially those « in general use in the building trade, « standard fittings and equipment.

« 3. For station buildings generally and « for non-industrial buildings the char- « acter of the countryside, climatic con- « ditions and local customs are taken into « account. Such buildings must not « become discordant factors in their « surroundings and nearly always need « to be specially designed.

« 4. It is likely that technical develop- « ments in the building industry will keep « step with the progress of prefabrication « systems.

« 5. The application of standard unit « construction does not need to destroy « initiative among technical staffs since « standards must be reviewed at due « intervals.

« Standardisation is also important in « that it effects economy in the time « employed in the design of structures. »

# NEW BOOKS AND PUBLICATIONS.

[ **385** (09 (45) ]

Dr.-Eng. G. DI RAIMONDO, General Manager of the Italian State Railways. — **Uno sguardo all'attivita delle F.S. nell'Anno 1953** *(A glance at the activities of the Italian State Railways during* 1953*)*. Extract from « Ingegneria Ferroviaria » No. 1, January 1954. — One brochure (8 3/4 × 11 1/2 in.) of 32 pages with 43 figures, 1954. Roma : *Ingegneria Ferroviaria*, Piazza Croce Rossa.

In this note, Dr.-Eng. Giovanni DI RAIMONDO, General Manager of the Italian State Railways, gives a brief report of the activities of his railway during the past year.

It is the work of reconstruction to which attention is first drawn, and amongst this the most important was the reconstruction of the great bridges which suffered especially during the war. Station installations and accommodation for the staff also absorbed a large proportion of the available funds.

In the second place, it was the electrical installations which had to be restored and modernised : the lines carrying the current used for electric traction, the central signalling equipment, telecommunication and lighting circuits, handling gear.

The chapter devoted to the stock lists all the improvements which were either extended or introduced to increase safety and comfort, as well as ease of maintenance. The railcars with internal combustion engine recently put into service and much liked by the public have been the subject of the most recent improvements. The mileage of both the electric and steam locomotives has increased. Iucreasing interest is shown in Diesel traction, both for the train services and shunting services.

In the chapter devoted to the traffic, the author reports various improvements made in the train mileage and timetables, a more liberal policy as regards industrial sidings, and the advantages which result from the new organisation EUROP now applied to the circulation of wagons from abroad.

Statistics bring out the increase in the passenger and goods traffic. The author reports the various steps taken in connection with the rates and in connection with the question of competition.

The financial results, although there is still an insufficiency of receipts, are better than those for the previous year. In the chapter dealing with these, mention is made of several innovations introduced in the accountancy methods, especially the perfecting of studies relating to the determination of the cost of transport.

The last three chapters describe the activities of the social services, the progress made in the sanitary services, and the many experiments carried out by the Research Institute with its improved laboratories.

During the year 1953, the Italian State Railways devoted themselves to both reconstruction and modernisation, and achieved very encouraging results.

E. M.

[ **621** .13 (02 & **621** .137 (02 ]

NIEDERSTRASSER (L.), Abteilungspräsident im Bundesbahn. Zentralamt Minden. — **Leitfaden für den Dampflokomotivdienst** *(Service Manual for steam locomotives)*, 8th edition, revised and increased. — One volume (6 × 8 1/4 in.) of XXXI + 606 pages with figures and appendices. — 1954, Frankfurt am Main. Verkehrswissenchaftliche Lehrmittelgesellschaft m.b.H. Jahnstrasse 43 (Price : leather bound : 24 DM).

The need for a manual of this sort is due to the existence of a large staff for which it must serve as a guide in the exercice of their profession. Moreover, at the time at which this 8th edition appeared, the Deutsche Bundesbahn had to train large numbers of drivers and firemen, as in spite of the progress made by the new methods of traction, the steam locomotive is still and will continue to be for many years to come, the engine which has to do the greater part of the work, at least in the author's country.

The spirit in which the work has been written is defined in a passage of the preface to the first edition. The descriptions merely present the essential and fundamental things, a knowledge of which should enable the driver to understand the phenomena occurring in the steam locomotive.

The work covers all parts of the locomotive : the boiler, the engine, the vehicle, the brakes, and the auxiliary equipment which all play a part in assuring safety of working.

The opening chapter studies the materials consumed and the chief metals used. Another deals with the theoretical principles of steam production, its use in the engine, the distribution. A long chapter is devoted to the question of brakes.

We will also mention the description of the chief special types of locomotives, that of the fixed installations required for their garaging and fuelling, the regulations and recommendations relating to driving them, and finally brief details on the maintenance service.

Amongst the novelties included in this eigth edition are : an entirely welded boiler and welded frames, mechanical loaders, oil heating, regulating the superheat, multiple exhaust gear, the reheating of the water by the exhaust gases.

The appended plates show numerous types of locomotives in section. Three drawings in colour show the working of the Hildebrand-Knorr brake for goods trains. Other plates, taken from LONORMEN (locomotives standards) give the standardised denomination of groups of components.

E. M.

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[ **625** .2 & **691** ]

**Kautschuk im Eisenbahnbau** *(The use of rubber in railway construction)*. — E. T. R. *Eisenbahntechnische Rundchau*. Sonderausgabe 3. (Technical Review of the Railways. Special Edition No. 3.) One brochure (8 1/4 × 11 3/4 in.) of 78 pages, illustrated. — 1954, Darmstadt, Carl Röhrig Verlag oHG, Stephanstrasse 8. (Price : 8 DM.)

When the first number of this new review appeared, the editor announced that special issues would be published dealing with important questions. This particular one is devoted to the use of rubber on the railways.

During the autumn of 1951, an International Rubber Bureau was opened at Frankfurt-on-Main, a German offshoot of the « Rubber-Stichting » of Delft (Holland). This bureau in September 1953 organised in Munich a series of Days

devoted to the study of modern applications of rubber. Numerous delegates from various European countries took part. The nine reports presented to this sort of Congress are now published in this form by the firm of Carl Röhrig of Darmstadt.

The most varied applications of this new material are studied in these reports : rail motor coaches, coaches, locomotives, the permanent way. In the case of rolling stock it is used as a constructional component as well as to damp out noise and oscillations, and again with the object of reducing maintenance. On electric rail motor coaches, it is used in the drive mechanism. It is also well known that it has been the subject of interesting trials for wheel tyres, full details of which are given here. One of the reports deals with the methods and machines used to determine the mechanical properties of rubber, which are still insufficiently known.

All these reports being in German, the publishers have increased the value of this publication by following each of them with a summary in four languages.

Railway engineers and rolling stock builders will all profit from reading these reports which are of real technical and scientific value.

E. M.

# MONTHLY BIBLIOGRAPHY OF RAILWAYS[1]

*PUBLISHED UNDER THE SUPERVISION OF*

**P. GHILAIN,**

**General Secretary of the Permanent Commission of the International Railway Congress Association.**

**(DECEMBER 1954)**

[ 016. 385. (02 ]

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1954 691
FORESTIER (V.)
**Calcul et exécution des ouvrages en béton armé.** Tome III, 4[e] édition.
Paris, Dunod, éditeur. Un volume (15 × 24 cm) de 770 pages, avec 126 figures. (Prix : 850 fr.fr.)

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**Procédés modernes de séchage des bois.**
Paris, Librairie Ch. Béranger, éditeur. Une brochure (13 × 22 cm) de 52 pages, avec 28 figures. (Prix : 480 fr.fr.)

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### In German.

1954 691
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(1) The numbers placed over the title of each book are those of the decimal classification proposed by the Railway Congress jointly with the Office Bibliographique International, of Brussels. (See « Bibliographical Decimal Classification as applied to Railway Science », by L. WEISSENBRUCH, in the number for November 1897, of the *Bulletin of the International Railway Congress*, p. 1509.)

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[ **016.** 385 (05 ]

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**1954** **621** .138 .2
Eisenbahntechnische Rundschau, Juli, S. 315.
BODE (O.J.). — Einordnung mechanischer Förderanlagen in die **Lokomotivbehandlung.** (11 000 Wörter & Abb.)

## Deutsche Eisenbahntechnik. (Berlin.)

**1954** **625** .285 (438)
Deutsche Eisenbahntechnik, Heft 7, Juli, S. 254.
MÜSSIG (W.). — Lieferungen von **elektrischen und Diesel-Triebwagen** an die Volksrepublik Polen. (3 000 Wörter & Abb.)

**1954** **625** .2
Deutsche Eisenbahntechnik, Heft 7, Juli, S. 259.
MÜSSIG (W.). — Wege zur **Verwirklichung des Leichtbaues im Waggonbau.** (2 000 Wörter, Tafeln & Abb.)

**1954** **624** .14 & **625** .2
Deutsche Eisenbahntechnik, Heft 7, Juli, S. 267; Heft 9, September, S. 339.
PRUSSAK (H.). — Die **Stosslücke im Gleis und ihre Auswirkungen auf Fahrzeuge und Oberbau.** (10 000 Wörter & Abb.)

## Elektrische Bahnen. (München.)

**1954** **621** .332 & **691**
Elektrische Bahnen, Juli, S. 165; August, S. 196.
WERNER (L.). — **Aktiver Korrosionsschutz bei Gleichstrombahnen** durch günstige Verlegung der Rückleitungen. (10 000 Wörter & Abb.)

**1954** **621** .332 (43)
Elektrische Bahnen, Juli, S. 177.
WAGNER (R.). — Die **Einheitsfahrleitung 1950** der Deutschen Bundesbahn. (2 000 Wörter & Abb.)

**1954** **621** .337 & **625** .258
Elektrische Bahnen, Juli, S. 180.
LANGKAU (H.). — Messung der Anzugskraft bei der Prüfung von **elektromagnetischen Schienenbremsen.** (800 Wörter & Abb.)

**1954** **625** .234
Elektrische Bahnen, August, S. 189.
BLATZ (H.) & CURTIUS (E.W.). — Belastbarkeit der Kupplungen und Hauptleitungen für die **elektrische Zugheizung.** (2 500 Wörter & Abb.)

**1954** **621** .335
Elektrische Bahnen, August, S. 202.
SAUER (H.-G.). — **Anfahren von Einphasen-Reihenschlussmotoren** mit Gleichstrom über Selen-Trockengleichrichter. (4 000 Wörter & Abb.)

## Europa-Verkehr. (Darmstadt.)

**1954** **385**
Europa-Verkehr, Jahrgang 1954, Folge 2, S. 67.
ARMAND (L.). — **A un tournant de l'histoire du chemin de fer.** (2 000 mots & fig.)

**1954** **656** .211 .7 (489)
Europa-Verkehr, Jahrgang 1954, Folge 2, S. 91.
TERKELSEN (E.). — Die **Fährschiffverbindungen** der Dänischen Staatsbahnen als Träger Europäischer Verkehrsaufgaben. (2 000 Wörter & Abb.)

**1954** **621** .33 (4)
Europa-Verkehr, Jahrgang 1954, Folge 2, S. 101.
SPENNRATH (F.). — Die **Elektrifizierung,** ein Beitrag zur Modernisierung der Europäischen Eisenbahnen. (3 000 Wörter & Abb.)

## Glasers Annalen. (Berlin.)

**1953** **621** .13 (03
Glasers Annalen, Dezember, S. 357.
METZELTIN (G.H.). — Ueber die **Benennung der Lokomotivteile.** Sprachstudie eines Ingenieurs. (10 000 Wörter.)

**1953** **625** .215
Glasers Annalen, Dezember, S. 370.
VOGEL (R.). — **Laufeigenschaften der einachsigen Lenkgestelle** von Gliedertriebzügen. (2 000 Wörter & Abb.)

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**1953** **625** .143. 3
Glasers Annalen, Dezember, S. 373.
FINK (M.). — Die Entstehung der **Schienenriffeln.** Der Stand der Riffelforschung nach rund 60 Jahren. *(Fortsetzung und Schluss).* (7 000 Wörter & Abb.)

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## Der öffentliche Verkehr. (Zürich.)

**1954** **621** .335 (494)
Der öffentliche Verkehr, August, S. 6.
**Neues Rollmaterial** der B.L.S. Neue Blaue Pfeile. (1 000 Wörter & Abb.)

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## Zeitschrift für Verkehrssicherheit. (Tübingen.)

**1952** **656** .25
Zeitschrift für Verkehrssicherheit, Heft 3-4, August-September, S. 111.
MASSUTE (E.). — **Grundlagen der Sicherheit im Eisenbahnbetrieb.** (10 000 Wörter & Tafeln.)

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# In English.

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## The Engineer. (London.)

**1954** **621** .431.72 (43)
The Engineer, April 9, p. 543.
**2 000 H.P. Diesel-hydraulic freight locomotives.** (1 600 words & figs.)

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**1954** **621** .131.3 (44)
The Engineer, April 23, p. 593; May 14, p. 704; May 21, p. 736; May 28, p. 773; June 4, p. 808; June 11, p. 844.
LIVESAY (E.H.). — **French locomotive experiences** *(to be continued).* (19 000 words & fig.)

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**1954** **621** .335 (42)
The Engineer, April 23, p. 604.
**Co Co locomotives for Manchester-Sheffield electrification scheme.** (1 800 words & fig.)

---

**1954** **656** .212.8
The Engineer, April 23, p. 612; April 30, p. 651.
LEE (J.G.). — **Rail transport wagon shunting machines** *(to be continued).* (6 600 words & fig.)

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**1954** **625** .17 (42)
The Engineer, June 11, p. 850.
**Siding clearing machine.** (200 words & fig.)

---

**1954** **625** .17 (42)
The Engineer, June 18, p. 891.
**Railway ditching machine.** (500 words & fig.)

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**1954** **621** .338 (42)
The Engineer, June 18, p. 899.
**Multiple-unit electric rolling stock.** (1 200 words).

**1954** **621** .131.3 (42)
The Engineer, July 2, p. 2; July 9, p. 38; August 20, p. 268; August 27, p. 284.
NOCK (O.S.). — **Present-day locomotive working in Great Britain.** X. — King's Cross- Edinburgh non-stop expresses. Parts I - II. (12 000 words & figs.)

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**1954** **621** .335 (68)
The Engineer, July 30, p. 168.
**3030 H.P. electric locomotives for South African Railways.** (3 000 words & figs.)

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## Engineering. (London.)

**1954** **656** .212.8 (42)
Engineering, July 2, p. 26.
**Remote-controlled marshalling gear for railway wagons.** Automatic or manual operation. (2 400 words & figs.)

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**1954** **625** .2 (42)
Engineering, July 9, p. 43.
CHADWICK (R.). — **Design stresses in light-alloy rolling stock.** (5 400 words & figs.)

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**1954** **621** .133
Engineering, July 30, p. 138.
POULTNEY (E.C.). — **Effect of boiler capacity on locomotive performance.** Superiority of large boiler revealed by comparative tests. (2 400 words, tables and figs.)

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**1954** **621** .438 (73)
Engineering, July 30, p. 153.
**An American steam-turbine locomotive.** (800 words & figs.)

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## Proceedings of the Institution of Civil Engineers. (London.)

**1954** **625** .13 (42)
Proceedings of the Institution of Civil Engineers, Part 1, Vol. 3. September, p. 506.
SCOTT (P.A.) and CAMPBELL (J.J.). — **Woodhead new tunnel :** Construction of a three-mile main double-line railway tunnel. (59 pages, illustrated)

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**1954** **625** .13 (42)
Proceedings of the Institution of Civil Engineers, Part 1, Vol. 3. September, p. 564.
SHARMAN (F.A.). — **Concrete quality control at Woodhead new tunnel.** (15 pages, illustrated)

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## Proceedings of the Institution of Electrical Engineers. (London.)

**1954** **621** .331
Proceedings of the Institution of Electrical Engineers, September, p. 309.
GARREAU (M.). — **Electric traction using 50-C/S current.** (2 800 words & figs.)

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**1954** **621** .335 (44)
Proceedings of the Institution of Electrical Engineers, September, p. 313.
NOUVION (F.). — **Electric locomotives on the Valenciennes-Thionville line.** (19 000 words & figs.)

## The Locomotive. (London.)

**1954** **621** .132.1 (68)
The Locomotive, March, p. 34.
**South African Railways 4-8-4 « Class 25 » locomotives** (2 000 words & figs.)

**1954** **621** .132.1 (460)
The Locomotive, March, p. 38.
**2-8-2 locomotives for Spanish Railways.** (900 words & figs.)

**1954** **621** .335 (945)
The Locomotive, March, p. 41.
**Victorian Government Railways main line electric locomotives.** (2 000 words & figs.)

**1954** **621** .335 (52)
The Locomotive, March, p. 48.
**Electric locomotives and motor coaches for Japan.** (600 words & figs.)

## Modern Transport. (London.)

**1954** **656** .25 (42)
Modern Transport, May 22, p. 5.
SHORTER (Merwyn W.). — **Safety on the railways.** (1 400 words & figs.)

**1954** **656** .28
Modern Transport, May 22, p. 11.
EDWARDS (H.N.). — **Railway carriage and wagon building.** (1 600 words & figs.)

**1954** **621** .33 (42) & **621** .431.72 (42)
Modern Transport, May 22, p. 16.
COCK (C.M.). — **Electric and Diesel-electric traction.** The industry in Great Britain. (1 900 words & figs.)

**1954** **621** .431.72 (42)
Modern Transport, May 22, p. 23.
**New main-line Diesel locomotive for B.R.** (1 500 words & figs.)

**1954** **621** .431.72 (42)
Modern Transport, May 29, p. 6.
**Lightweight Diesel trains in Great Britain.** (1 800 words & figs.)

**1954** **621** .132.3 (42)
Modern Transport, June 5, p. 3.
**New class 8 Pacific for British Railways.** (1 800 words & figs.)

**1954** **621** .33
Modern Transport, June 5, p. 5.
WARDER (S.B.). — **Electric traction.** — Basic characteristics of systems now in use. (1 200 words.)

**1954** **621** .338 (42)
Modern Transport, June 19, p. 5.
**Suburban electric stock.** — Multiple-unit sets for **Manchester-Glossop.** (1 500 words & figs.)

**1954** **656** .2 (6
Modern Transport, June 26, p. 7.
MARTIN (J.R.P.). — **The East African Railways.** 1 900 words & figs.)

## Modern Railroads. (Chicago.)

**1954** **625** .232 (73)
Modern Railroads, September, p. 63.
**A dome for the lower level, too!** (1 800 words & figs.)

**1954** **625** .232 (73)
Modern Railroads, September, p. 123.
**Santa-Fe tests « hi-level » coaches.** (1 600 words & figs.)

## The Oil Engine and Gas Turbine. (London.)

**1954** **621** .431.72 (675)
The Oil Engine and Gas Turbine, March, p. 400.
**Special railcar for Belgian Congo.** (1 300 words & figs.)

**1954** **621** .431.72 (84)
The Oil Engine and Gas Turbine, April, p. 446.
**Bolivian railcars made in Britain.** (1 600 words & figs.)

**1954** **621** .431.72 (42)
The Oil Engine and Gas Turbine, May, p. 8.
**First units of B.R. Diesel train programme.** (1 400 words & figs.)

## Railway Age. (New York.)

**1954** **625** .232 (73)
Railway Age, April 5, p. 58.
**Upper-level lounge in the Santa-Fe's... full dome for coach passengers.** (8 600 words, tables and figs.)

**1954** **621** .438 (73)
Railway Age, April 12, p. 25.
**The Union Pacific gas-turbines.** (2 200 words & figs.)

**1954** **621** .438 (73)
Railway Age, April 19, p. 44.
**Ash separation the key to coal-burning turbine progress.** (2 800 words & figs.)

**1954** **385** .587 (73)
Railway Age, May 10, p. 19.
**New NYC organization provides new operating staff tools.** (3 000 words & diag.)

**1954** **625** .23 (73)
Railway Age, May 17, p. 100.
**Trends in passenger car design.** (1 800 words & figs.)

**1954** **625** .232 (73)
Railway Age, May 24, p. 27.
Here is Pullman-standard's new **stainless-steel passenger car.** (800 words & figs.)

**1954** **625** .241 (73)
Railway Age, May 24, p. 35.
**New 70 ton flat cars have roller bearings.** (500 words & figs.)

**1954** **625** .241 (73)
Railway Age, May 31, p. 35.
**An all purpose flat car.** (400 words & figs.)

**1954** **621** .338 (73)
Railway Age, July 5, p. 27.
These new cars to improve... **New Haven commuter service.** (1 600 words & figs.)

**1954** **621** .438 (73)
Railway Age, July 26, p. 30.
Meet « Jawn Henry ». (1 000 words & figs.)

## The Railway Gazette. (London.)

**1954** **625** .1 (460)
The Railway Gazette, July 2, p. 10.
**New construction in Spain.** (1 500 words & figs.)

**1954** **656** .2
The Railway Gazette, July 9, p. 39.
**Moving road trailer on railway wagons.** (1 200 words.)

**1954** **621** .338 (42)
The Railway Gazette, July 9, p. 41.
**Electric rolling stock for Manchester Glossop service.** (1 200 words & figs.)

**1954** **385** .32 (42)
The Railway Gazette, July 16, p. 66.
**Reorganisation scheme for British Railways.** (1 800 words.)

**1954** **385** .32 (42)
The Railway Gazette, July 23, p. 94.
**British Transport Commission (Organisation) scheme, 1954.** (2 000 words.)

**1954** **625** .17 (42)
The Railway Gazette, July 23, p. 97.
**Mechanised relaying on single lines.** (400 words & figs.)

**1954** **621** .134.1
The Railway Gazette, July 30, p. 123; August 6, p. 150; August 13, p. 178.
POULTNEY (E.C.). — **Locomotive cylinder performance.** (3 400 words & figs.)

**1954** **625** .143.5 (42)
The Railway Gazette, July 30, p. 129.
**Fastening flat-bottom rails.** (400 words & figs.)

**1954** **621** .335 (493)
The Railway Gazette, August 6, p. 155.
BAYENS (F.). — **Belgian electric rolling stock.** (2 400 words & figs.)

## Diesel Railway Traction. (London.)

**1954** **621** .431.72 (43)
Diesel Railway Traction, March, p. 51.
**German streamlined Diesel trains.** (2 500 words & figs.)

**1954** **621** .431.72 (675)
Diesel Railway Traction, March, p. 59.
**11 600 H.P. locomotives for the Congo.** (2 600 words & figs.)

**1954** **621** .431.72 (94)
Diesel Railway Traction, April, p. 76.
**Tasmanian Diesel-hydraulic locomotive.** (500 words & figs.)

**1954** **621** .431.72 (94)
Diesel Railway Traction, April, p. 77.
**High-quality locomotives for Australia.** (4 500 words & figs.)

**1954** **621** .431.72 (675)
Diesel Railway Traction, April, p. 87.
**Main-line locomotives for Africa.** Belgian-built units for the Matadi-Leopoldville line. (3 000 words & figs.)

**1954** **621** .431.72 (46)
Diesel Railway Traction, May, p. 102.
**Diesel electric shunters for Spain.** (2 800 words & figs.)

**1954** **621** .431.72 (489)
Diesel Railway Traction, June, p. 125.
**Main-line locomotives for Denmark.** (4 500 words & figs.)

**1954** **621** .438 (73)
Diesel Railway Traction, June, p. 142.
**Westinghouse gas-turbine locomotive.** (2 200 words & figs.)

## Railway Locomotives and Cars. (New York.)

**1954** **625** .23 (72)
Railway Locomotives and Cars, May, p. 56.
Canadian National spends $ 59 million for **new passenger cars.** (3 400 words & figs.)

**1954** **625** .25
Railway Locomotives and Cars, June, p. 57.
**Disc brakes.** — How they work. — How to maintain them. (2 400 words & figs.)

**1954** **621** .438
Railway Locomotives and Cars, June, p. 61.
**Where the gas turbine locomotive is heading** (2 500 words & figs.)

**1954** **625** .232 (73)
Railway Locomotives and Cars, June, p. 65.
How forces are transferred in **three-level, full length dome cars.** (3 600 words & figs.)

## Railway Track and Structures. (Chicago.)

**1954** **625** .17 (73)
Railway Track and Structures, March, p. 57.
**Large mechanized gang... cleans ballast.., raises track..., renews ties... and finishes job.** (3 200 words & figs.)

**1954** **625** .13 (73)
Railway Track and Structures, April, p. 45.
Special techniques permit Mississippi River Bridge to stay in service when... **renewing pins in truss spans.** (4 000 words & figs.)

**1954** **624** .5 (73)
Railway Track and Structures, May, p. 50.
NAPIER (E.J.). — Reduces cost through unusual **bridge erection plan.** (2 400 words & figs.)

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**In Spanish.**

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## Boletin de la Asociación del Congreso Panamericano de Ferrocarriles. (Buenos Aires.)

**1954** **621** .431.72 (73)
Boletin de la Asoc. del Congreso Panameric. de Ferrocarriles, mayo-junio, p. 35.
BLICKLE (T.T.). — Ferrocarril de Santa Fe. **Experienca adquirida en el uso de locomotoras Diesel-electricas.** (4 000 palabras.)

## Ferrocarriles y Tranvias. (Madrid.)

**1954** **656** .25 (460)

Ferrocarriles y Tranvias, Junio, p. 200.

SOLE PLANAS (P.). — Consideraciones sobre algunos aspectos del **plan de mejoras de señalización y cambio del Codigo de Señales** en la RENFE. (3 000 palabras & fig.)

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**1954** **625** .14

Ferrocarriles y Tranvias, Junio, p. 209.

BALBAS (A.). — **Funciones mecanicas de la traviesa y del balasto.** (2 400 palabras.)

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## Revista de Obras Públicas. (Madrid.)

**1954** **624** (460) & **691** (460)

Revista de Obras Públicas, julio, p. 342.

LOPEZ BUSTOS (J.). — **Puente de hormigon pretensado** sobre el rio Tordera. (2 000 palabras & fig.)

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# In Italian.

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## Alluminio. (Milano.)

**1954** **621** .392 & **665** .882

Alluminio, luglio, p. 377.

PROVENZALI (P.). — **Confronto sul piano tecnico ed economico tra saldatura ossiacetilenica e saldatura elettrica in gas inerte delle leghe leggere.** (5 000 parole, tavole & fig.)

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## Giornale del Genio Civile. (Roma.)

**1954** **72**

Giornale del Genio Civile, giugno, p. 425.

LOJACONO (P.). — **Statica delle terre e muri di sostegno.** Esposizione di un nuovo metodo di calcolo delle spinte e delle reazioni alla base del muro. (2 000 parole, tabella & fig.)

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**1954** **721** .4

Giornale del Genio Civile, giugno, p. 430.

GIANGREGO (E.). — **Statica e stabilità delle strutture scatolari precompresse.** (4 000 parole & fig.)

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## Ingegneria Ferroviaria. (Roma.)

**1954** **621** .133

Ingegneria Ferroviara, luglio-agosto, p. 577.

TARTARINI (W.). — Aggiornamento del **calcolo della vaporizzazione nelle caldaie** da locomotiva. (4 000 parole & fig.)

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**1954** **621** .431.72

Ingegneria Ferroviaria, luglio-agosto, p. 587.

LEUZZI (V.). — **Influenza del sistema di trasmissione sulle prestazioni e sui consumi delle locomotive Diesel.** (6 000 parole & fig.)

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**1954** **656** .254

Ingegneria Ferroviaria, luglio-agosto, p. 599.

LEGA (L.) & GUARNASCHELLI (G.). — **L'evoluzione della rete telegrafonica ferroviaria.** (4 000 parole & fig.)

## Rivista di Ingegneria. (Milano.)

**1954** **624** .6

Rivista di Ingegneria, luglio, p. 781.

PERUCCI (G.). — **Comportamento statico dei ponti ad arco** in un caso particolare di solidarietà con l'impalcato. (1 500 parole & fig.)

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# In Netherlands.

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## De Ingenieur. ('s-Gravenhage.)

**1954** **625** .42 (485)

De Ingenieur, nr 29, 16 Juli, p. V. 55.

SCHIPHOUWER (G.W.). — De **Tunnelbaan** in Stockholm. (4 000 worden & fig.)

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## Spoor- en Tramwegen. (Utrecht.)

**1954** **656** .28

Spoor- en Tramwegen, nr 12, 10 Juni, p. 201.

VAN DER MEULEN (J.H.). — **Openbaar onderzoek naar spoorwegongevallen.** (1 500 worden.)

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**1954** **656** .132

Spoor- en Tramwegen, nr 12, 10 Juni, p. 203; nr 13, 24 Juni, p. 228; nr 14, 8 Juli, p. 246.

MEULMAN (J.J.H.) & ZEEVENHOOVEN (N.H.C.E.). — **Aanhangwagens voor autobussen.** (10 000 worden & fig.)

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**1954** **621** .137.3 (492)

Spoor- en Tramwegen, nr 13, 24 Juni, p. 219.

BIEZEVELD (L.J.). — Een nieuwe methode voor het **opmaken en bekendstellen van de dagorder op de tractiedepots.** (1 200 worden & fig.)

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**1954** **625** .144.1

Spoor- en Tramwegen, nr 15, 22 Juli, p. 253; nr 16, 5 Augustus, p. 273.

JACOPS (A.). — Over **rails van onbeperkte lengte.** (4 000 worden & fig.)

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**1954** **625** .617 (44 + 460)

Spoor- en Tramwegen, nr 16, 5 Augustus, p 269.

EICHHOLTZ (F.E.). — **Wagons met verwisselbare assen** in het verkeer tussen Spanje en Frankrijk. (2 000 worden & fig.)

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# In Portuguese.

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## Gazeta dos Caminhos de ferro. (Lisboa.)

**1954** **385** .114

Gazeta dos Caminhos de ferro, nº 1601, 1 de Setembro, p. 241.

VIEGAS DIAS (J.G.). — **Coeficientes de elasticidade do transporte de passageiros** em caminho de ferro. (1 500 palavras & fig.)

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| Directory of Railway Officials & Year Book 1954-1955 *(New Books and Publications.)* . . | November | 1126 |
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| Jahrbuch des Eisenbahnwesens, 1953. *(Annual review of Railway Matters) (New Books and Publications)* . . . . . | August | 821 |
| Annuario de Ferrocarriles y Transportes Regulares por Carretera. 1950-1953. *(Railway and Regular Road Transport Annual) (New Books and Publications)* . . . . . | » | 826 |
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| **385 (061. Officially recognised Associations.** | | |
| Asociación del Congreso Panamericano de Ferrocarriles. VIII. Congreso (Washington, 12-25 de junio de 1953) *(Panamerican Railway Congress. Report of the VIIIth Congress. Washington, June 12-25, 1953) (New Books and Publications)* . . . . . | October | 1066 |
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| Géographie Universelle des Transports. Tome II : Géographie des Chemins de fer d'Europe. Volume I : Suisse-Italie *(Universal Geography of Railways. Geography of the European Railways. Volume I; Switzerland-Italy)*, by H. LARTILLEUX *(New Books and Publications)* | » | 819 |
| Indian Railways. One hundred years, 1853-1953. *(New Books and Publications)* | » | 822 |
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